

CREATION SPEAKS

HAROLD W. CLARK

A Study of the Scientific Aspects of the Genesis Record of Creation and the Flood.

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Preface

This book is for the layman, not for the scientist. It is intended to be non technical and non argumentative, for the author is convinced that the fundamental principles regarding science and the Bible can be expressed in ordinary everyday language. Its purpose is to present the viewpoint of a creationist with respect to scientific problems involved in a literal interpretation of Genesis.

It is a good thing for a writer on a controversial subject such as this to state his fundamental philosophy at the beginning. Accordingly it may be said that the basic assumptions upon which this treatise is built are these:

1. The Bible is the inspired word of God from Genesis to Revelation.
2. The Genesis record of the creation and early days of this earth is not allegorical or of the nature of myth or folklore, but is an inspired historical record.
3. Any true scientific theory regarding the origin and early history of the earth and its life must agree with a plain, simple, obvious rendering of that record.

Clear distinction must be made between the facts of science and theories by which scientific data are interpreted. To all men the facts must be the same, because facts cannot be changed; on the other hand, the interpretation of the facts may vary according to one's background of training and experience. Hence we should ever be careful to separate scientific facts from theories which, while they may aid in the search for truth, should not be confused with the truth itself.

Belief in evolution or creation, either one, is based upon certain assumptions. The evolutionist must assume that the earth is very ancient, with its age reckoned in billions of years. The forces of nature are assumed to have been at work in a more or less uniform manner throughout the long ages of geological time. And finally, those forces are assumed to have been resident in nature. Whether resident forces are inherent from all eternity, that is, automatically present, without the intervention of any supreme being, or whether endowed by the power of God at some vaguely distant "beginning," makes little difference. The presence of resident forces, by which nature behaves as a self-operating mechanism, is an essential part of the evolutionary philosophy.

The creationist, on the other hand, if he accepts the Genesis record literally, is committed to a short chronology. This does not imply that Ussher's chronology is necessarily correct in every detail. However, the history of the earth is to be reckoned in terms of thousands rather than millions or billions of years. Such a viewpoint must of necessity involve faith in supernaturalism as opposed to the acceptance of naturalism by the evolutionist. And, instead of nature's being a self-running mechanism, it is understood by the creationist to be under the direct and continuous control of the power of an infinite God.

Heretofore nearly all the discussions of the evolution-creation question by creationists have been of a negative character, that is, devoted largely to an attempt to disprove evolution. This has been due to the belief that if evolution were to be disproved, the creationist interpretation would be left as the only alternative. Such a method is not to be condemned; nevertheless, it fails to give an understanding of the place which a great wealth of facts occupies in the creationist interpretation. These facts have been so assiduously applied to the evolutionary scheme that unless one gets the positive view of the question, he is liable to feel that the majority of the facts, after all, support the theory of evolution. There are not a few creationists who think that they must cling to their faith in creation in spite of the facts actually or seemingly arrayed against them.

The purpose of this presentation 1 is to approach the problem from the positive side. Accepting the Genesis record as historically accurate, we shall discuss the scientific aspects of creation and the early history of the earth, and show how the facts of science support a literal interpretation of Genesis.

**HAROLD W. CLARK
Angwin, California.**

Contents

1. What Do These Things Mean?
2. In the Beginning
3. Let the Earth Bring Forth
4. Each After His Kind
5. Death and Decay
6. To Destroy the Earth
7. A Flood of Waters
8. After the Flood
9. Paganism or Literal Creationism
10. Creation and Science

1. What Do These Things Mean?

NOT long ago a released internee from a prison camp in the Orient brought to America several fragments of human skulls and teeth discovered in various parts of China. Upon examination these were observed to differ considerably from corresponding parts in modern man, being more massive, somewhat different in shape, and, in case of the teeth, much larger. Thereupon the experts proceeded to reconstruct three new races of primitive men, dating them back farther than any other specimens.

Naturally we wonder upon what basis such reconstruction could be made, and where the line between fact and theory is to be drawn. The person who is skeptical of all such methods is inclined to ridicule the whole procedure as a deliberate attempt to perpetuate an unfounded theory. On the other hand, there are some facts that are a bit puzzling. For instance-

In the Scientific Monthly of October, 1946, Dr. Krogman of the University of Chicago tells of a test case devised by him to check on the accuracy of such reconstruction. Selecting a specimen from the dissecting tables of the anatomy laboratories, he carefully measured and photographed the head and face. Then he allowed its dissection to proceed, after which the skull was cleaned. The skull was turned over to a sculptress with instructions to make a lifelike reconstruction. As to the results, Dr. Krogman says: "The measurements [of the reconstructed head] agreed astoundingly. With but one exception all measurements agreed to within 1 millimeter. [A millimeter is 1/25 of an inch.] Most important of all, the restoration was recognizable as that of the subject drawn." - Page P6.

Going back to the other side of the question again, one can readily ask what this really proves. Suppose the anthropologist can reconstruct a head, or even a whole body accurately, what lived? Because does that prove as to the time when that individual a skull may have large, apelike teeth, does it prove the individual to be a primitive apelike ancestor who lived half a million years ago? And even if he might have been "primitive" (or degenerate) in appearance, does that indicate an evolutionary background for the human race? Many questions might be raised. Such a case demands careful study before hasty conclusions are reached.

EVOLUTION OR CREATION

One day a student stopped at my desk at the close of a lecture on the evolution question. "How is it," he asked, "that anyone can raise such questions regarding evolution when all the great scientists are agreed on it?" A fair question this was, we cannot deny. Why should there be any controversy? Is not evolution proved by sound scientific facts, well-authenticated? To read popular textbooks one would be led to this conclusion. If it is not true, where are the flaws in the proofs?

H. G. Wells, in his book *The Science of Life*, accuses creationists of being dishonest and muddleheaded and holding out stubbornly against evolution when it has been "proved up to the hilt." He cites line after line of evidence upon which the evolution theory has been built. Let us take a brief review of his proofs, as they will give as clear a grasp of the problem as one can find anywhere.

First, there is the evidence from the rocks. Invariably, when faced with the problem of creation versus evolution, the scientist will say: "But what about the geological record?" The fundamental principle,

Creation Speaks

we are told, is simple. It is said that the different layers of rocks were laid down in order. Therefore all we have to do is to examine these layers and to read from them the past history of the earth.

Surprisingly simple, we admit, is this method. There is one serious question, however. Do the rocks tell a story of slow and uniform deposit, or might they have been laid down rapidly? Such a possibility makes it necessary for us to reserve judgment on the geological theory and investigate the problem more fully before we draw final conclusions. Horses and camels and elephants and many other animals have been found in the rocks, with variations in each group running from simple to complex. However, these various groups have been assembled from scattered localities and are arranged in series. This arrangement is then pointed out as proof that the higher evolved from the lower. The fact seems to be overlooked that God might have created such series in the beginning.

But, says the geologist, the simpler ones are found in lower rocks than are the more complex. Suppose, for sake of discussion, we admit that they are. What does this prove? Could not one type have lived in a different environment than the other, yet have lived at the same time?

Other lines of evidence are supposed to show man's relation to the lower animals. In all vertebrates, for instance, we find a common pattern for the limbs. The arm consists of an upper part, with one bone, a lower part with two bones, a wrist with several small bones, and a hand and fingers. Although this pattern is modified in different vertebrates, the same general plan may be seen in the whole group. To a superficial thinker this is certain proof that all these animals came from common ancestors. But is that a necessary conclusion? Might not a study of the facts point the way to a different answer to the problem?

Supposedly unanswerable proofs for evolution are presented in the data from embryology. The young embryos of reptiles, birds, and mammals are so much alike that to naked-eye observations they cannot readily be told apart. Upon this fact is based the theory that all higher animals have been derived from common ancestry. And so firmly fixed has this notion become, even in the minds of scientists, that all popular textbooks on biology discuss the theory as if it were actually proved to be true.

The actual fact is that while modern biologists believe in evolution, they admit that studies on the embryos of the various groups give little evidence for evolution, and actually raise more problems than they solve. One needs to be cautious lest he allow popular opinion to dull his sense of critical analysis and to lead him to accept theories in the place of truth. We must leave detailed consideration of the question for later study, but in passing it may be said that it gives us another example of how supposedly sound scientific principles need to be carefully checked before being accepted at face value.

VARIATION IN PLANTS AND ANIMALS

Rocks and bones do not constitute the only puzzle. Living creatures have caused as much discussion as geological phenomena, and perhaps even more. Ever since Carolus Linnaeus, in the middle of the eighteenth century, mistakenly thought he was able to distinguish as many kinds as God had created in the beginning, the question of the origin of species has been a potent source of controversy. When in 1859 Charles Darwin proposed to explain the origin of species by means of natural selection, the scientific world turned from the Linnaean viewpoint, and biology entered the Darwinian era. The near century that has passed since then has left most people bewildered by the vast accumulation of material on this phase of the question.

Life changes, as may be realized by observation on domestic animals such as dogs, rabbits, pigeons, and other kinds. No one doubts but that the great variety of these animals is due to changes which have occurred since they were in a wild state. From this simple fact the scientist deduces that changes in plants and animals in nature have brought about the present variety of living things from former creatures that were different from those we know today. Thus the Darwinian theory of origin of species through variation seems on the face of it to have good support in readily observable facts.

The question is not so simple as it appears. Some authorities of high standing dispute the interpretation which Darwin gave. Variation which may be observed and checked does not lead to new species, declares Goldschmidt, one of the world's greatest biologists. See R. B. Goldschmidt, *The Material Basis of Evolution*, page 396.

The biologist who accepts the Genesis record literally is particularly strong in his objection to Darwin's evolutionary views. For example:

"It is one thing to recognize this very manifest tendency in nature for organisms to vary, but it is an entirely different matter to prove that such variation has been the mechanisms by which the present state of organisms has been built up." - F. L. Marsh, *Evolution, Creation, and Science*, page 259.

Creation Speaks

The present writer made a similar statement in his book *Genes and Genesis*, pages 141, 142:

"The fact that variation occurs, and that it may at times be of such a nature as to form what might be recognized as new species does not afford sufficient ground for explaining the origin of the major type forms, such as genera, families, or orders, within which and from which such species have arisen."

Thus the controversy goes on. The facts which H. G. Wells and other evolutionists accept as proofs for evolution are not so readily received by others with equally keen powers of reason. The evolutionary theory is not so firmly established as some would like to believe.

One point in particular is worthy of attention. "There is no other imaginable illumination" of the living world except the light which evolution shed on it, says Wells. See page 404. One is reminded of the words of Scripture: If therefore the light that is in thee be darkness, how great is that darkness!" Matthew 6:23. No other imaginable illumination! Why has the evolutionist overlooked the simple truth that nature may reflect the glory of the Creator?

The marvelous adaptations seen in nature cannot be explained upon any mechanical basis. Where did honeybees learn to build their wax combs? How did wasps and hornets "evolve" their method of paper building? How does evolution explain the origin of such a complicated structure as the human eye? How did such a complicated structure as the retina in the eye or the organ of Corti in the ear, or the speech mechanism, or a hundred others, happen to be where they are and be so perfectly adjusted as to work together to form a harmonious mechanism? Surely there must be some other way except to believe that such a situation came about by chance.

Two misunderstandings appear to be common. Evolutionists misunderstand the creationist views; the reverse is equally true. They are like the medieval knights who fought over whether a shield was red or black, only to find that it was red on one side and black on the other.

Creationists ordinarily accuse evolutionists of being atheists, assuming that acceptance of the theory of evolution must inevitably lead to belief in pure mechanical action in the whole universe, with no place for God in any natural processes. The modern decline in religion is generally attributed (by creationists) to the influence of evolutionary teaching. The fact is overlooked that there are many devout Christians who believe that evolution is the process used by God to produce the present state of the world.

THE QUESTION AT ISSUE

Evolutionists, on the other hand, accuse creationists of holding to all kinds of unscientific notions. Some years ago a certain candidate for governor of Florida was supported by William Jennings Bryan, who at the time was attracting considerable attention for his opposition to evolution. Whereupon Arthur Brisbane, the well known columnist, in one of America's leading dailies, made the following comment:

"He probably believes that all kinds of men, microbes, animals, horses with one or four toes, dinosaurs, hippopotamuses, okapis, 500 kinds of fleas, 10,000 kinds of snakes, 100,000 kinds of beetles and bugs, and all the others were created separately and individually by the expressed will of the Creator and were all in the ark together."

In a more serious view, a strictly scientific writer has said that creationism is "that hypothesis which conceives that the inorganic world as well as the organic species were created by God, but, once created, remain unchanged." - B. Petronievics, *Evolution Universal*.

At the famous Scopes trial in 1925, when a court dealt with the evolution question, the experts who filed their testimony on the side of evolution took the position that any change in plants and animals must mean evolution.

And so it goes. Where are we, anyway? What is evolution, and what is it not? What is meant by creation? What processes of change may be allowed and one yet be a good creationist? Or can one be a creationist at all if he recognizes that plants and animals have changed and are now changing? These and scores of other equally pertinent questions must be clarified if one is to know where he stands. The answers do not come from any dogmatic pronouncements, but from painstaking study of the facts from nature. The purpose of the following chapters is to present these facts and point the way to the conclusions which they demand.

It must always be kept in mind that true science and a correct rendering of the Genesis record will be in perfect harmony, for both have the same author. God's power is responsible for the origin of the world and for all natural processes of the past and present. All things take place in harmony with the laws which He has established. He is also the author of the Bible, for "holy men of God spoke as they were moved by the Holy Ghost." It is the work of the true scientist to discover the truth in both fields science

and religion-and to properly relate the facts of nature to the principles revealed in the word of God.

2. In the Beginning

THE theory of evolution is built on the age-old philosophy of uniformity of natural forces. The apostle Peter clearly expressed this philosophy when he described modern skeptics as proclaiming that “since the fathers fell asleep, all things continue as they were from the beginning of the creation.” 2 Peter 3:4. This viewpoint, according to which nature is supposed to be endowed with power for carrying on its activities, was the very essence of all ancient pagan philosophical systems. Matter and energy were, to the ancient philosophers, the eternal realities of existence, existing independently of any creative power.

ORIGIN OF THE EVOLUTIONARY THEORY

The origin of such ideas is somewhat obscure, but appears to have been due to a failure to recognize the existence of a personal Supreme Being. The apostle Paul gives a suggestion on this point in the first chapter of Romans. He speaks of the ancients as holding “the truth in unrighteousness” (verse 18), implying that they had once had the truth, but had corrupted it. This corruption had come about as the result of vain imaginations (verse 21) which darkened their hearts. The French translation of this verse is interesting, for it speaks of the heart’s becoming destitute of intelligence. In verse 23 Paul plainly reveals the influence of such vain imaginations. The glory of God was changed “into an image made like to corruptible man, and to birds, and four-footed beasts, and creeping things.” In other words, the attributes of the “uncorruptible God were applied to nature, and men “worshiped and served the creature rather than the Creator.” Verses 23, 25, margin. Nature worship, or the worship of gods who were personifications of natural forces, became the central theme of pagan religion.

SCRIPTURAL VIEWS

Opposed to this pagan philosophy throughout the centuries has stood the Scriptural doctrine of a personal supreme God, the Creator of the heavens and the earth. He is introduced in the first verse of the Bible: 1n the beginning God created the heaven and the earth.” His power is recognized in the Ten Commandments. “For in six days the Lord made heaven and earth.” The psalmist declares: “He spoke, and it was done; He commanded, and it stood fast.” Throughout the prophetic books He is set forth as the One who had made all things. New Testament writings testify to the power by which He made and upholds all things. From Genesis to the Revelation, therefore, the story is a consistent one, with no suggestion of a self-existent or self operating nature.

Belief in supernaturalism was orthodox in the Hebrew religion until Greek philosophy brought in pagan concepts, after the Alexandrian conquests had spread Greek culture over the world. Again, after the time of Christ, we find a pure supernaturalism in the writings of the apostles, and not until Augustine and others of his time introduced Greek philosophy into Christianity did the church depart from faith in God as the Creator and upholder of the universe.

In this connection it will be well to consider the meaning of creation as taught by the Scriptures.

The creationist viewpoint gives dignity and meaning to the astronomic, geographic, climatic, and biotic features of the earth. Instead of looking at all the marvels of nature as mere accidents, and life the greatest accident of all, the person who believes the Bible record sees purpose and plan in everything. God made the earth “to be inhabited,” and to that end He combined all the forces of earth, sea, and sky. The manner in which He organized this earth as the home for our first parents is so simply told in Genesis that it is generally regarded as a mere tale that has no scientific value. But let us examine it and see how its scientific aspects appear under close scrutiny.

DAYS OF CREATION

“In the beginning.” This simply means that at first, or originally, or when God first undertook the creative work. There is nothing in it to indicate any time period, either long or short.

“God created.” The pagan concept of self-existing matter is here dispelled by the idea that God created the heaven and the earth. The Hebrew word bara implies that a new thing has been produced, and

Creation Speaks

not from anything of its kind previously existing.

“And the earth was without form.” It was not created as a fully completed world.

“And void.” The earth, when first created, was empty of life and those refinements of nature that make life possible.

“And darkness was upon the face of the deep.” The “deep” is from the Hebrew t’hom, which is translated into the Greek as abussos (English, abyss). Many meanings have been given to it, but its real meaning of great depth, bottomless space, or immense expanse seem especially significant.

“And the Spirit of God moved upon the face of the waters.” Since the words spirit, breath, and wind may all be translated from the same original word, several translations have been made. But the King James Version quoted above is the simplest and most consistent. The meaning seems to be that the Holy Spirit was the agent through whom the creation was accomplished. The text becomes clear and beautiful when we read it this way: And the Spirit of God acted upon the face of the abyss. In other words, using this as an intermediate connecting thought, we have the story thus: Darkness was upon the great abyss, and the Spirit of God acted upon this abyss, and God said: “Let there be light.”

Were the days of creation real days, or were they indefinite periods of time? One of the first arguments one meets on this point is the statement in .2 Peter 3:8: “One day is with the Lord as a thousand years, and a thousand years as one day.” From this it is argued that when the Lord gave the record of the days of Genesis, He did not intend to imply that these were literal days, but rather that the record should be taken in a figurative sense.

Those who make this claim overlook the reading of the context. Peter is here discussing the long-suffering of God and trying to show that the reason ungodly men are not quickly destroyed is that God is “not willing that any should perish.” Verse 9. On the other hand, this mercy will eventually reach its end, and “the day of the Lord will come.” Verse 10. The whole question is that of God’s attitude toward the end of the world, not toward its beginning.

The best evidence on any questionable passage is the internal evidence,-to be found in the passage itself and its context. Upon examination of the first chapter of Genesis we find that at the close of the record of each day occur the words: “And the evening and the morning were the first day,” second day, etc. Here is brought to view a definite sequence of night and day, the same kind of day apparently as that in the second chapter, where the Sabbath is mentioned as a day of rest. Furthermore, there is absolutely no meaning to evening and morning as applied to geological periods. According to popular interpretation of the rocks, the succession of deposits with their plant and animal remains took place continually, and with no distinct universal breaks in deposit that could be correlated with the “days” of Genesis.

The principal reason for refusing to accept the Genesis record of creation literally is the acceptance by modern scientists of the theory of uniformitarianism, or the idea that all natural forces have acted uniformly throughout all past time. This modern philosophy was foreseen by Peter when he spoke of the skeptics of our day who declare: “All things continue as they were from the beginning of the creation.” 2 Peter 3:4. Obviously, if the uniformitarian doctrine were the true interpretation of the past, direct creation in six days would be only a tradition or folk tale. But it should be pointed out that the uniformitarian hypothesis propounded by Hutton and Lyell has never been proved. It is both unproved and unprovable. Any conclusions based on it are as uncertain as the hypothesis on which they are built.

It has been supposed by some that the light of the first day was unlike anything known at present. And perhaps it might not be wrong to suppose that the act of creating material substance would be accompanied by brilliant light, for modern atomic physics has shown that units of light energy (photons) are related to the production of certain units of matter. We cannot make any dogmatic statements regarding this, but the idea may have something worthy of study.

Or, it may well be understood that when God spoke matter into existence, the darkness that filled the great “deep” or “abyss” of space would be illuminated as the matter of the earth caught up the rays of the sun and began to reflect them outward.

THE FIRST DAY

It is evident from the record that from the very beginning of the creation process the earth formed a body capable of casting a shadow, for of the first day, as of every other day, it is said: “The evening and the morning were the first day.”

It has sometimes been said that the light of the first three days was due to the special presence of God, inasmuch as the sun was not made until the fourth day. To postulate such a light would require that

Creation Speaks

some source of illumination should exist only on one side of the earth. For it must be recognized that light is not an entity of itself; it cannot exist apart from some luminary. To say that the light was miraculous, or due to the presence of God, is to invoke the miraculous as a means of explaining that for which we can find no other answer. Certainly it was miraculous, for the whole creation process was a miracle. But to invoke a miraculous light for three days in order to fit our preconceived ideas that the sun was actually brought into existence on the fourth day, is a hazardous procedure.

The record of the fourth day says nothing as to the time when the sun was actually formed, and there is no Scriptural or scientific reason why it may not be understood as being in existence and casting its light over the earth from the very beginning of the first day, at least. Whether it was created at the time the earth was formed or long before, there is no way of knowing.

The Genesis record tells nothing of the work of the first day except the presence of light and its separation from the darkness. But it is evident, as we consider the structure of the earth, that either God spoke the matter of the earth into existence instantly, all in proper place, and then did nothing else for twenty-four hours, or else He occupied the time of the first day in organizing and arranging the materials. There is no good reason for believing in the former suggestion, but it is consistent with the nature of the creation story to consider each day's work as a series of events. Accordingly we might understand that the first day's work was concerned with bringing the original chaotic mass, which was "without form," into an organized globe.

THE SECOND DAY

Evidence for the progressive nature of creation is seen in the record of the second day. At this time the separation of the elements continued so as to produce a firmament, or atmosphere, above the earth. Nothing else is mentioned for this day, but it is likely that the processes of the first day were continued. This is suggested by the fact that the record of the third day describes further movements of the substance of the earth.

Considerable study has been given to the description of the waters which were above the firmament. Some have interpreted this as meaning atmospheric water vapor, others have supposed that it referred to a "sea" of vapor floating above the atmosphere. In support of the latter view is the fact that water vapor is lighter than air, water vapor having a molecular weight of 18, air of about 29. On the other side of the case is the question as to why such a vapor shell should not exist at present.

Advocates of the vapor shell theory point to the forty days of rain at the time of the Flood, and declare that there must have been a much more extensive source of supply than could have been possible from the vapor suspended in the air. They suppose that certain changes in the electrical condition of the atmosphere must have occurred in order to precipitate the vapor shell about the earth.

After a careful study of all aspects of this question, it must be admitted that since there are so many uncertainties involved, and so little known in detail, a positive conclusion is exceedingly difficult to draw. After all, the essential point is that during this day the earth was brought one more step along the way toward becoming a fit home for plants, animals, and human beings.

One might ponder at length at the wisdom of the Creator as revealed in the mechanics of the atmosphere. As the science of meteorology is studied, and it is seen how many wise and beneficent provisions are made for the needs of living creatures, it is easy to believe that the mysteries of the air are the work of an all wise Creator. Many scientists have recognized the marvelous manner in which the surroundings are fitted to the needs of plants and animals. God's handiwork can readily be seen in the firmament.

THE THIRD DAY

The record of the third day is brief, like that of the second. Gigantic movements must have taken place in obedience to that simple command to let the water be gathered together in order that the dry land might appear. In consideration of this day, it is well for us to keep ever in mind that the earth is not merely a mass of rock thrown together in an unorganized mass. Even now, after the destructive work of the Flood on its surface, the earth still shows remarkable evidences of the symmetry of its original structure.

In the first place, the earth is a huge magnet, with a core of iron and nickel. Because of its weight and of its rigidity, which is approximately equal to that of a steel ball, and because of the presence of iron and nickel in meteorites that fall upon the earth, we conclude that these materials comprise the greater bulk of the inside of the earth. Outside of this core of iron and nickel lie the crystalline rocks, with the heavier

basaltic materials deep in the earth and the lighter granite rocks nearer the surface.

The outer portion of the earth, for a depth of one hundred miles or more, is known as the "crust," so-called because of older theories that there was a molten interior surrounded by a cooler mass, or crust. In spite of the rejection of the theory of a molten interior by modern geologists, the term crust is still used.

Much of the crust has been so changed by the Flood that it is difficult to form a picture of the nature of the outer rocky framework before that event. Doubtless it was much different from anything we know today, for our sandstone, shale, limestone, and many igneous rocks appear to be superficial products of the violent forces of the Flood.

One point is of particular interest. Underlying the sedimentary rocks everywhere that mines, oil or water wells, or canyons have penetrated them, are found the twisted and folded layers of the "basement complex." This is composed of generally fine-grained crystalline rocks such as mica-schist, gneiss, or similar rocks that appear to have been produced by distortion forces. In some cases it may be that these rocks were formed by disturbances in the earth shell at the time of the Flood. In many cases, however, they seem to form series of bent, folded, and twisted layers that have been truncated, or worn off, as if by some gigantic plane before the surface sediments were deposited upon them. The evidence suggests that these rocks may represent the remnants of the original skeleton of the earth as it was brought into position during the earth movements of the third day.

According to the record, as soon as the land and water areas were established, the dry land became clothed with vegetation. But let us pass that phase of creation, dealing with it in connection with other life forms, and give our attention more fully to the changes in the earth that were necessary in order to make it a satisfactory home for man and animals.

THE FOURTH DAY

On the fourth day the greater and lesser lights were set in the midst of the firmament, thus establishing the great time cycles. If the reader will notice carefully the account of the fourth day, he will see that nothing is said as to when the sun, moon, and stars were actually brought into existence. As for the stars, many of them are known to be millions of years old, for they are so distant as to require immense periods of time for their light to reach the earth. In passing, let us suggest that the idea that God created these distant suns each complete with beams of light already reaching outward throughout all space, if accepted, would destroy all belief in the regularity of God's laws. All that we know of God's manner of producing light teaches us that when He causes a body to become luminous, beams of light energy travel outward from the source, and are not set in action instantaneously along), the whole path of the light beams. God works in regular ways and according), to definite laws. We should not attempt to explain away His laws to fit our own opinions.

Further, it should be kept in mind that creation involved not only production of matter, but its organization and setting in relation to other material bodies. Accordingly the creative act of the fourth day appears to have been a process by which the great luminaries were established in the firmament of heaven to serve as markers for days and years and seasons.

The viewpoint of creation that assumes the sun to have been in existence on or before the fourth day and to have given light upon the earth from the very beginning of creation week makes the whole story consistent and simple. The only objection that can be brought against this interpretation is the idea that some have retained from their childhood days, of the fourth day as the time of formation of the sun, moon, and stars. On the other hand, since creation means organization as well as production of material, the work of the fourth day is reasonably understood as part of the organization of the earth in relation to the other members of the system, just as reasonably as to understand the work of the other days as organizational,- which they were largely, if not entirely. For there is no reason to believe that any new material substance was produced after the first day. Even the living things were made from the substance of the earth.

3. "Let the Earth Bring Forth"

THE story of the third, fifth, and sixth days is briefly told in Genesis. In order came plants, water and air life, and finally land life, including man. In all cases except that of man, the statements are

significant: "Let the earth bring forth." This seems to exclude the common idea that God spent the time of these three days in a series of commands that caused one kind after another to appear full-grown. It rather suggests some sort of developmental processes by which the earth itself brought forth the living creatures. Possibly Milton's picture of the lion gradually emerging from the earth is not so fantastic as might be supposed at first thought. We might well imagine a rapid embryonic growth, as it were, in which, through the agency of the Spirit of God, living cells appeared, and grew to full maturity in the course of a few hours.

Of course, all this may seem like pure speculation; but after all it must be remembered that God works in a systematic manner; and the events of creation week should 'be thought of as orderly and systematic rather than haphazard and irregular. Today, as we study the laws of embryonic development, we find ourselves face to face with the most complicated, the most mysterious, the most marvelous, of all natural laws. Each embryo goes through a certain series of stages, which vary according to the class to which it belongs. Many of the processes involved in the growth of the organism are beyond the comprehension of the greatest scientists. The creative power of God is manifested in every new individual that is produced-plant, animal, or mankind.

GENESIS KINDS

Throughout the record occur the expressions "after his kind" and "after their kind." A reflective study on these expressions reveals much that is worthy of careful thought. Here is revealed the orderliness of nature. The plants and animals were not isolated and unrelated individuals, but were grouped into divisions, some large, some small, each with its peculiarities by which it was distinguished from others.

Occasionally we are told that the taxonomic (classification) system is artificial, or is worthless because it has been developed by evolutionists. To those who have been troubled by this idea it may be pointed out that our present system of classification owes its origin largely to a creationist, Carolus Linnaeus. Furthermore, the fact that a man believes in evolution does not preclude his being able to recognize relationships in nature, even though his views on this subject may be influenced to a certain degree by his evolutionary philosophy. Let us examine the classification system of the vertebrate animals as an example and see how their natural characteristics given to them by the Creator have been recognized by the students of classification.

The vertebrates are divided into seven distinct classes, and no one who studies carefully their characteristics can have any question but what they represent natural groups. They are: (1) Cyclostomata-lamprey eels, (2) Elasmobranchii-cartilaginous fishes, (3) Pisces-bony fishes, (4) Amphibia-frogs, toads, and salamanders, (5) Reptilia-turtles, snakes, lizards, crocodiles, (6) Aves-birds, (7) Mammalia-animals covered with hair and nourishing their young with milk. If on the sixth day of creation, when the dog type passed before Adam, the Lord had asked, 'What kind of animal is that? Adam certainly would have no hesitation in assigning it to the mammal "kind." It surely was neither fish, amphibian, reptile, nor bird.

Let us follow this thought a bit further. In the mammals we find several orders, among them the rodents, carnivores, hooved animals, elephants, whales, etc. These, while they have the general mammalian characters in common, are different in certain features which make it easy to separate them. Again, had Adam been asked, "What kind of mammal is that?" he could readily have answered that it was a carnivore. This group possesses several features in common that distinguish it from all others. For instance, there is a typical tooth pattern, as may be seen by comparing the teeth of a dog with those of a rat or of a grazing animal. Among the order Carnivora are several families, each distinct enough to be readily separated. Teeth, feet, and other anatomical structures are characteristic. The dog family differs sufficiently from the cat family so that few if any of these animals give any difficulty of classification. Similarly the other families of carnivores -raccoon, bear, weasel, hyena-each have their own peculiarities. Anyone trained in vertebrate natural history can recognize the skeletons instantly. And so, if Adam had been asked regarding the dog, 'What kind of carnivore is this?' he could have answered, "It is the dog kind."

Thus far it appears reasonable to conclude that the taxonomic system now in vogue, as far as the higher categories are concerned, is a natural one. The classification of the dog as belonging to the Phylum Chordata, Subphylum Vertebrata, Class Mammalia, Order Carnivora, and Family Canidae is perfectly in harmony with natural relationships that must be recognized by anyone, evolutionist or creationist. The latter individual sees in this classification the outworking of the grand plan of the Creator in accord with His command, "Let the earth bring forth after his kind."

It is in the lower categories, the genera and species-that difficulties in classification arise. Of the

questions arising from this study we shall speak more in detail in the next chapter.

COMPARATIVE ANATOMY

The zoologist points to the similarities between animals homologies, as he calls them-as evidence that they have arisen from common primitive ancestors. Because a man, a dog, and a horse have similar skeletal structures, they are assumed to have been produced by an evolutionary process.

The argument from homology, or comparative anatomy, is valuable only upon one assumption—that evolution is known to have taken place. In other words, if it were known that all the animals had arisen by evolution, then clearly the dog and the horse would be more nearly related than the dog and a fish.

But, on the other hand, if a person is skeptical regarding the validity of the evolutionary theory, there is nothing in these facts to prove that it really did take place. The facts of comparative anatomy can as readily be explained on the basis of a plan in the mind of the Creator as on the basis of the evolutionary theory.

It must be noted here that some will admit this argument, but maintain that evolution was the method the Creator used in developing His plan. This belief is generally known as “theistic evolution.” The chief objection to this viewpoint is that it destroys all the literal meaning of the Genesis record, and opens the way for the complete rejection of belief in creation and the Flood.

Not only that, but the theory that God used evolution as the method of creation implies the idea that struggle and death were ordained by God as part of the divine plan for populating the earth. Surely we cannot believe that such a plan was the best God could devise!

DISTRIBUTION OF LIFE

The distribution of life over the earth at creation is a point worthy of some attention. By many it has been assumed that the earth was of uniform climate, practically all lowland, and having the same kind of plants and animals everywhere. There is no good reason for such an assumption. The evidence from the fossils indicates that there was a wide variety of life, living under many different conditions.

One of the most surprising conclusions to be drawn from a study of the rocks of the earth is the fact that in the ancient world there were none of the oceans and continents as we know them today. The earth appears to have been divided into two great land masses. The northern mass occupied much of Asia, Europe, and North America. This is shown by the presence of a large number of fossil plants and fresh-water animals distributed quite generally over these regions. The southern mass occupied most of India, Australia, South Africa, and South America. In these regions the plants and animals were much different from those of the northern land area. Of course we know little regarding the deposits on the floor of the oceans, but probably they were once part of the land masses. For instance, the ancient land which geologists call Gondwana land probably included most of the Indian, south Atlantic, and south Pacific oceans.

Between these larger lands the seas extended around the world as long narrow strips, with a branching network which left no major portion of the earth many hundreds of miles from the water, as we find in the large continents of our day.

Many parts of the earth appear to have been occupied by land areas whose only remnants today are solid crystalline blocks. Apparently all the higher materials were swept away, leaving only the cores of these ancient highlands. No one can estimate the height of these ancient lands, but from a study of the fossils it is evident that there were fairly cool regions; the natural conclusion would be that there was sufficient altitude to produce considerable variation in climate. There is no good reason for refusing to believe that these majestic heights originally rose several thousand feet, and that there were larger and smaller bodies of water at various levels, giving the earth a rich fauna and flora, beyond anything now known.

A bit of thoughtful meditation will lead one to the conclusion that when God declared the earth to be “very good,” there must have been infinite variety and perfection of beauty. Man might pronounce a thing very good when his crude sense of values would admit of much imperfection. But the divine benediction upon the newly created earth, we must admit, involves more than we can imagine in variety, interest, and wealth of plant and animal life.

4. Each After His Kind

ALREADY we have made several references to the creation of plants and animals, each "after his kind." Let us now investigate the matter more fully, for it involves one of the points of greatest controversy in recent times-the question of the origin of species.

Three words have a similar meaning-Greek, species; English, kind; and Hebrew, min. Of these the first is the only one that has an exact meaning, and that is by definition. In other words, no one knows what a "species" is except as the word is defined. And there are various definitions as different aspects of the species problem are studied by different investigators. What species may have meant a hundred years ago as compared to its meaning today depends on how the word is defined.

As to kind, there is no exact meaning to the word. It may mean a large group, as when we speak of the vertebrate kind, or it may mean a small group, as when we speak of the different kinds of rabbits or dogs or squirrels. Because of this, and because God never gave us a definition of the word in the Bible, we have no means of knowing exactly what sort of group He had in mind when He said: "Let the earth bring forth . . . after his kind." Any attempt on our part to define the word is futile, for in the end any definition will depend entirely on our personal concept of the original categories into which plants and animals were divided in the beginning.

What has been said for kind applies equally to the Hebrew word min, which means the same, and from which kind is translated.

The question may naturally be raised, Was there not in the original creation some ultimate unit, some final group, which was clearly separated from all others, so that one would not become confused with another? Doubtless an affirmative answer should be given to this question. But whether we can decide what these original units of creation were, is a question that demands considerable study.

GENESIS KINDS AND MODERN SPECIES

As an illustration let us examine in some detail the relationships between wolves and foxes. Linnaeus gave the name *Canis lupus* to all the gray wolves of Europe, most of Asia, and most of North America. To the gray wolves of Southwestern North America he gave the name *Canis mexicanus*. Later workers extended the name *mexicanus* to all the gray wolves of North America, thus separating them from the European and Asiatic *lupus*. At present the American wolves are divided into six species of the genus *Canis*. And so, what was at first a large group has been split up into several smaller ones, and the term species applied to what at first were subspecies.

The European and Asiatic red fox is *Vulpes vulpes*. European taxonomists call the American red fox *Vulpes vulpes fulva*, thus considering it a subspecies of the other. But Americans separated the American red fox from the European and called it *Vulpes fulva*, thus raising it to full standing as a separate species. Still later studies have made ten "species" from this one American form which was at first considered only as a subspecies.

The coyote is *Canis latrans*, and varies somewhat from the wolf in shape, size, and behavior.

The problem is further complicated by the fact that the distinction between wolves, foxes, and jackals is not always clear. Linnaeus called the gray wolf *Canis lupus* and the red fox *Canis vulpes*, considering them both as dogs-genus *Canis*. The South American foxes are more like *Canis* than are others. The Arctic fox is intermediate between *Canis* and *Vulpes*. The gray fox was classified by one American taxonomist as *Canis*, but it was later placed in a separate genus *Urocyon* because it differed from both *Canis* and *Vulpes*. Another authority classed the red fox as *Canis*, as did Linnaeus; but this, too, was changed. In India the wolves *Canis pallipes*, resemble jackals. Thus it can be seen that wolves, foxes, and jackals are not easy to separate. Many more details might be given to illustrate this point.

The bearing of these facts on the question of the Genesis "kind" is interesting. What did God create,-one pair of wolves, from which all the above have descended, or a pair of wolves, of foxes, and of jackals, or several of each? If we were to assume that gray wolves, coyotes, gray foxes, red foxes, Arctic foxes, and all the jackals and their tribe could have arisen by gene and chromosome changes from one pair of wolflike animals, the problem would be simply one of recognizing the amount of change necessary to produce these different groups. Whether we classify them today as separate genera, species, or subspecies is purely a matter of convenience. The intergradations between these groups would indicate that a certain degree of crossbreeding has taken place. Those who maintain that two Genesis "kinds" could not cross

would likely be led to assume that there was only one pair in the beginning.

If, on the other hand, we were to assume that God made a pair of wolves, of foxes, and possibly of jackals, then it would not be hard to explain the origin of all the present "species" as having arisen from a few original "kinds." Here, however, the problem of crossbreeding comes in, for these groups are more or less interfertile. If they are considered as originating from separate created kinds, then we must admit the possibility of crossbreeding between two kinds.

Which of these two viewpoints is taken is immaterial to the problem in hand. After all, it is obvious that no matter how many "species" modern taxonomists may choose to recognize, no matter how many different wolves, foxes, and jackals may have arisen from the original, whether from one or several created "kinds," the most important fact of all to be recognized is that the wolves, foxes, or what we choose to call them, are distinct from cats, bears, or weasels. There is not one scrap of evidence to show how members of different families could have arisen one from another from common ancestry. The differences between these larger categories are too great to be bridged by any known changes in genes or chromosomes.

Carolus Linnaeus, a Swedish botanist who in the eighteenth century established our present system of classification, declared that he recognized as many species of plants and animals as were created in the beginning. But an examination of the classification which he gave to many of these shows how impossible it would be to maintain such a position. Many changes have had to be made in his classifications. Furthermore, he seemed to be quite ignorant of the problem of geographical distribution. How a whole series, for instance, of red foxes could be distributed over the world, with each species created where he found them, seemed not to have entered into his thinking.

Whatever we may decide as to the boundaries of the original types, one more troublesome question confronts us. What kept these animals apart? Why did they not interbreed and thus confuse the plan of the original creation?

One attempted solution to this question is to say that they did not interbreed because of the law of heredity that each must breed "after his kind." But it should be noted that the command given in Genesis was one for creation, not for propagation. If animals originally did not interbreed simply because they could not, then we should witness in nature all manner of corruption, with offspring made impossible as a means of preserving the characteristic of the species. The "morals," if we might so use the word, of the animal kingdom would be nonexistent.

What, then, would keep each kind to itself? Clearly there must be some sort of psychological instinct which would lead an animal to interbreed only with others of its own kind—using the word kind in the sense of the ultimate unit of creation.

In plants, instinct could not be invoked as an explanation for their separation, but there are many possible means whereby it would be impossible for foreign pollens to bring about development of seed. Seasonal differences, variation in modes of pollen distribution, chemical differences, and other such means could readily be concerned in order to keep each kind to itself.

The significance of this problem may be realized if we recall that, according to the Genesis record, although animals were created after their kinds, all flesh later corrupted itself; but the corrupted kinds were not saved in the ark, for they went into the ark and came out of it after their kinds. From the record it is apparent that confused kinds came about as a departure from the original plan of creation.

ORIGIN OF SPECIES

Not long after Linnaeus propounded the idea that species represented the kinds created by God in the beginning, other men became interested in the opposite aspect of the question, the degree to which change had taken place. A French contemporary, Count Buffon, declared that the presence of many variations in plants and animals made the Linnacan concept of species untenable. In 1809 Lamarck, the French biologist, proposed the first definite theory of evolutionary development. But it was not until Charles Darwin published *The Origin of Species* in 1859 that the world was turned away from the creationist views to a full acceptance of evolution.

Darwin's theory was based on the well-known fact of variation among living things. In any area the number of offspring produced during any season is greater than can be supported by that area. Thus there is set up a struggle for existence. In this struggle those will survive which are the best fitted to meet the environmental conditions. This is known as "the survival of the fittest." This would lead, Darwin argued, to a "natural selection" of the fittest and an elimination of the unfit.

One modern example will illustrate the principle. In the Tularosa Basin in New Mexico are found black mice living on black lava and light-colored mice living on light lava. Both are apparently descendants from the common gray mice. Variability in color possesses a definite "survival value," for it has caused the animals colored most nearly like their surroundings to be less readily seen by hawks and other enemies. The result has been an eventual production of races that differ greatly in color.

Here is where natural selection plays its true role. In a given population where variations are continuously arising, the ones best adapted to meet the struggle for existence would survive, whereas the ones less fortunate would succumb. The survival of the fittest is a real phenomenon every field naturalist must reckon with.

Variations in characteristic features furnish the material upon which natural selection may act, and by this means new types are produced which are better adapted to the environment. The mistake is easily made of assuming that these variations are unlimited in extent. It is one thing to observe change in color, size, etc., but an entirely different matter to postulate changes in body form, structure of vital organs, and the like sufficient to produce new types of animals. This latter kind of change is necessary if the Darwinian theories are to be applied to the origin of new types. The assumption of such far-reaching changes in structure as are demanded by the application of the law of natural selection to the problem of the origin of species in the broadest sense is an assumption that is unwarranted by the evidence that is available at the present time.

After all, natural selection is a conservative force. During the centuries since natural conditions have become fairly well stabilized, and since plants and animals have become adjusted to what we choose to call normal conditions, the average rather than the unusual would be the best fitted to survive. Anything unusual is always a target for attack by both men and animals. It is the common form which is the least likely to be noticed. If it were not for the effect of natural selection, unusual variations would propagate and spread rapidly, with the result that our common assemblages of living species would change so rapidly we could hardly keep pace with the changes in our catalogues of classification and distribution.

Why, then, has such objection been raised against Darwinism? Largely because of the fact that it did not recognize the limitations of this theory. Taking the facts Darwin had so painstakingly brought together, he extended them to cover the problem, not only of the origin of species, but of larger groups as well, applying them almost universally to all the processes involved. Throughout *The Origin of Species* Darwin made the mistake of confusing natural selection with the general theory of evolution, and his readers have made the application more universally than ever he dared to make it. The proofs which had been collected for the "origin of species by natural selection" were plausible proofs for natural selection. They were not, however, proofs that natural selection was the method by which new species had always, or even commonly, come into being. Neither were they proofs that evolution rather than special creation was the manner by which living creatures originally came into existence. Here is where creationists object to Darwinism, for they maintain that he carried these principles to lengths that are not justified by observable data. The creationist viewpoint is one of limitation of the amount of change rather than the disallowance of any change whatsoever. It has been the inconsistent rigidity of the views of some creationists in the past that has created the popular prejudice toward creationist doctrines. The acceptance of the facts of variation by evolutionists has made the evolutionary viewpoint seem the more reasonable. There is no good reason, however, why the evolutionary views should dominate practical biological studies. The facts might with equal effectiveness be made to harmonize with the creationist doctrines. An answer to these problems will be found in a study of recent developments in the science of genetics -the laws of heredity.

EVIDENCE FROM GENETICS

Modern genetics has thrown much light on the degree of change in living things and on the causes of these changes.

In the nucleuses of all cells of the body of any plant or animal are minute bodies known as "chromosomes." Located on these, somewhat like beads on a string, are tiny granules of protoplasm called genes. These are the carriers of hereditary qualities, or "characters." Such characters as hair and eye color, shape of body parts, distribution of color pattern, size and shape of fruit, quality of seeds, and hundreds of others are known to be due to the influence of the genes. Sometimes a gene undergoes a change, or mutation, and its effect is changed. For instance, the gene for red eyes in fruit flies has been known to mutate in such a way as to produce several other colors of eyes, such as apricot, eosin, pink, etc. Such mutations are a prolific cause of new qualities.

Chromosomal aberrations are the result of unusual or abnormal changes in the whole or considerable portions of chromosomes. A fragment may break away from one chromosome and become attached to another. Thus the characters carried in that fragment are deleted from one and added to the other. Portions of chromosomes may become reversed in position, with a resulting change in effect. Whole chromosomes may be lost from one cell and gained by another, and when this irregularity is passed on to the offspring, a new manifestation of the hereditary qualities results.

Recombinations are normal variations that occur in every generation. In every cell the chromosomes lie in pairs, one member of each pair having been derived from one parent, one from the other. When the germ cells are produced, these chromosomes separate, one going to each new cell. Let us imagine a species with four pairs of chromosomes. Let A, B, C, and D represent the chromosomes received from one parent, and a, b, c, and d those from the other. Then they will be in pairs Aa, Bb, Cc, and Dd. When these are distributed to the germ cells (gametes) there is no way of knowing which ones will go to any particular gamete, except that there will be one member of each pair. Thus there will be all the following possibilities: ABCD, ABCd, ABcD, ABcd, AbCD, AbCd, AbcD, Abed, aBCD, aBCd, aBcd, abCD, abCd, abcD, abed. When these 16 possibilities in the female gamete are combined with the same 16 in the male gamete, it would require a checkerboard of 256 squares to illustrate all the possible combinations. When it is known that the common rabbit, for example, carries no less than a dozen such pairs of chromosomes, it can be seen how widely variant the recombinations may be. The number of gametes possible may run into thousands, and the number of different offspring possible by recombination may run into millions,

The series of horses, camels, elephants, and other mammals in the Tertiary deposits are generally regarded as the strongest proofs of evolution. Before drawing any conclusions on this point, let us examine the evidence. First we shall consider the "horses."

Evolutionary geologists begin the "horse" series with a small animal about the size of a terrier. This had general skeletal features resembling a horse. But instead of one toe, there were four on the front foot and three on the hind foot. The other toes were rudimentary-only partially developed. The teeth, instead of having ridges like those of modern horses, had rounded tops adapted for grinding. This simple horse like animal belongs to the genus Eohippus, the dawn horse,-since it represents what is supposed to have been the beginning of the horse evolution.

FOSSIL SERIES

There are several others in the series. Orohippus lacked the rudimentary hind toes. In Epihippus the central toe was larger than the others. Mesohippus had three toes. Miohippus was as large as a sheep. Parahippus had the outer toes much reduced and the middle toe more prominent. The teeth resembled modern horses more than did the previous members of the series. Meryhippus was as large as a small pony, and the teeth showed still more likeness to those of modern horses. Pliohippus had still more complex teeth, with the enamel ridges well developed.

Many of the members of the horse series have been found in sufficient numbers to make it appear that they were bona fide species, but instead of representing progressive series they may as well be considered as ecological types. Three-toed "horses," especially the ones with spreading toes, would be fitted for life in marshy or soft ground. They were comparatively slow of gait, as their leg structure indicates. Their teeth show them to have been fitted for browsing on twigs and coarse herbage.

The larger horses were fitted for life on the plains. The single toe, the long, slender leg bones, the fusion of tibia and tarsus, all point to the adaptation for speed on hard ground. The teeth were adapted for chewing the grasses that naturally grow on the plains. Between the two extremes are adaptations to environment midway between marsh and plain. They are often spoken of as forest horses." The three artificially arranged classes of "horses" listed above, when viewed in the light of ecological principles, are easily explained without resorting to evolution.

The camels and elephants show a similar situation to that existing in the horses. And the same principle of adaptation to ecological conditions may be applied to them as well as to the horses.

In any series of forms such as these the serial arrangement is due in part to systematic relations rather than to actual descent. In other words, in any group of similar animals such as these one might naturally expect to find graded variations. The fact that such gradations occur and that two or more structural features such as feet, teeth, etc., show parallel increase in complexity, in no way proves evolution. A horse, for instance, with simple feet fitting it for marshy ground would be expected to have

simple teeth. A horse with highly specialized feet fitting it for open grassy plains would be expected to have specialized teeth for chewing the grasses of the plains.

In modern types we find similar series. The rabbits of the West vary from the tiny pygmy rabbit through the bush rabbit and snowshoe rabbit to the long-legged, long-eared jack rabbit. Each of these is adapted for a special environment.

The weasel family shows a series of animals whose structural features make exactly as good an adaptive series as do the ancient mammals. There are several sizes of weasels, the aquatic minks, the fisher, marten, and wolverine. Anyone finding these as fossils would be able to prepare as convincing evidence of their evolution as has been done for the Tertiary mammals. And yet there is absolutely no proof that one has evolved from another, or all from common stock. There is no way to prove that they were not all created as they are today.

In like manner it would be possible to arrange the kangaroos and their relatives on an evolutionary scale, yet there is no proof that they have evolved. Furthermore, they are all living at the same time today. Why could we not conceive of the Tertiary mammals as living contemporaneously?

Examples might be multiplied, but why go on? By this time the inferences are clear and the conclusions obvious. By accepting the idea of creation of adaptive types, fitted to an environment whose variations were systematically arranged, by allowing for a certain amount of variation such as is observed in living animals, one may explain the fossil series without invoking long geological ages.

NO EVIDENCE FOR EVOLUTION

The evolutionist has overlooked one vitally important principle; namely: All the known variations take place within the kinds; there is no evidence for the change from one kind to another entirely new one. For instance, millions of variations might take place in rabbits, but they would still be rabbits. Many changes occur in foxes, but they remain foxes. Rats are still rats; guinea pigs are still guinea pigs. No amount of change is known by which one of these types can be changed into another.

Not only is there no evidence of change of one kind into another, but fossil remains fail to show evidence for change from one major group to another at any time in the past. If, as the evolutionist believes, there had been changes throughout the geological "ages," millions and millions of years in the past, fossil material should have been discovered to show the transition from one type to another. But such evidence is absolutely lacking. Mollusks have always been mollusks, echinoderms have always been echinoderms, arthropods have always been arthropods.

In the light of these facts we can safely assert that the major groups—the phyla, classes, orders, and families—have not undergone any change since their appearance on the earth. All the change that is known affects only the genera and species. Here the creationist may accept all the valid evidence for change, for he realizes that such changes are not sufficient to bring about evolution. The Genesis statement that the plant and animal kingdoms are organized systematically, each "after his kind," is fully vindicated by all the discoveries of modern science; for it is evident that our present species and genera do not represent the Genesis "kind." On the other hand, the larger categories have remained unchanged—cats have always been cats, dogs have always been dogs. There is no proof in nature for the origin of the higher groups from any other ancestry except their own kind.

HOW DO NEW SPECIES ARISE?

A review of the latest experimental evidence indicates that species may change their characteristics because of (1) mutations or changes in genes, (2,) changes in chromosomes due to irregularities in division and distribution, and (3) combination of chromosomes from different species. The material upon which natural selection and isolation may work for the production of new species is furnished by these changes. The limits to which mutations may go are determined by the pattern of the genes of that particular species. Changes which modify the chromosomes beyond the pattern make development impossible or produce sterile offspring. Many new kinds are produced by hybridization, but here the limitations for successful propagation are very closely circumscribed.

The bearing of these studies on the problem of evolution is of major significance. Those who know these principles the best are the ones who most frankly admit that, while there is abundant and quite satisfactory evidence for the existence of those changes which result in new species, there is no satisfactory way in which these facts can be made to explain the origin of the larger groups. In other words, there now exists, thanks to the latest genetic evidence, a clear insight into how new species are produced, but no

explanation for the origin of the larger categories.

5. Death and Decay

POPULAR science is puzzled over many things, for it fails to reckon with two fundamental principles: (1) that the earth was created perfect, and (2) that the advent of sin brought death and degeneration upon all living things. Not only were the results of sin seen in the fall of man and his loss of dominion over nature, but every living creature suffered from the curse in two ways. In the first place, the usurper, Satan, was unable to control the kingdom he had seized; in the second place, he deliberately set about to corrupt and destroy. Only in the light of these facts can we understand what has happened to plants and animals since sin came into the world.

Some undesirable features in nature seem to be but the natural results of degeneracy. Thorns and thistles are merely modified leaves and stems. Poisonous plants have been produced by changes in the chemical products formed within their tissues. Weeds are nothing more than plants that have developed the ability of growing at the expense of more desirable kinds while furnishing nothing of particular value in the form of flowers, fruit, or seeds.

The corruption in the animal kingdom is seen in many ways. One evidence of the departure of animals from the original plan is seen in the confused species that have come from intermingling of different kinds. Without doubt the original kinds were so clearly differentiated that there would be no difficulty in distinguishing them. But today there are several intermediate species which so partake of the nature of two or more kinds that they appear to have come from a cross between them. Whether or not we admit of crossing between the original "kinds, it is apparent that today, to a considerable degree, commingling of different kinds does occur.

Among common living animals and plants a student occasionally finds one that could easily be explained as having come by hybridization. In California the oracle oak looks like the black oak in every way except that the leaves are evergreen and somewhat like those of the Coast live oak, which grows in the same region. Hybrid willows are common. The tanbark oak partakes of characteristics of both oak and chestnut, yet it is neither an oak nor a chestnut in typical form. Certain birds possess a combination of features of two families, as, for example, the Townsend solitaire, which is sometimes called the "fly catcher thrush," inasmuch as it shows characteristics of both flycatchers and thrushes. The hyena has several features of both dogs and cats, as can be readily seen by anyone who studies its appearance. The wildebeest of Africa has both horse and cattle characteristics.

The degree to which the original plan of creation was corrupted by Satan is revealed by a study of certain verses in Genesis.

In the story of the Flood are the significant words: "God looked upon the earth, and, behold, it was corrupt; for all flesh had corrupted his way upon the earth." Genesis 6:12. An analysis of this statement reveals two important facts-first, that all flesh was involved in the general corruption, and second, that all flesh had corrupted his way upon the earth.

It is commonly taught by those who accept the Biblical record of the Flood that the destruction of the earth came only as a means of clearing it of wicked men. This is a restricted concept, and fails to recognize the full significance of the event. The Scripture clearly states that all flesh was included. Genesis 6:17; 7:21. The testimony of the Scripture, according to its own definitions, is that both human and animal life was involved. Wilhelm Cesenius, noted for his Hebrew scholarship, supports this view in his comments on these verses.

As to the statement, "had corrupted his way," it is obvious that whatever is meant, the condition must have been serious to call down the dire vengeance of God. A synonym for corrupted is adulterated, which means mixed with other kinds than what is supposed to be present. Other definitions are tainted, which has the same implication; contaminated, or invaded by foreign substance; polluted, or impure from a mixture with matter from without; also debased, depraved, and defiled. In man, since he is a moral creature, corruption could come in a moral way by a departure from the principles of right. In other creatures no such spiritual corruption could be possible. Some other means of corruption must be sought in order to satisfy the full meaning of the text. To say that nature was corrupted simply because of man's sin

is not sufficient. The presence of degeneration in the form of thorns and thistles, which are generally considered the curse laid on the earth as a result of man's departure from the right, would not be a cause for destruction of the earth by a flood. Furthermore, the conditions produced by the Flood have favored the development of such degenerative changes a thousand fold as compared to what we find to have been the case previously. Something else must have been involved.

Gesenius tells us that the expression "his way" refers to the manner of life, the plan, scheme, or habitual mode of life. This plainly indicates that living creatures so changed or perverted their modes of action or conduct as to have departed from the original plan of God, until all were corrupt, or confused, contaminated, defiled, debased, and perverted. In no other way could animals, having no moral responsibility, have fulfilled the statements of the Author of Genesis.

CARNIVOROUS ANIMALS

It is likely that the carnivorous habit arose as a change in habits of certain animals. The members of the order Carnivora (flesh eaters) were able to take to the predatory habit because the nature of their teeth and claws enabled them to do so. With the adoption of such a mode of life their dispositions have undoubtedly changed. The fierceness of the lion and tiger has probably been developed during the years as generation after generation has been obliged to obtain food by preying upon other animals. This is not a case of inheritance of acquired characters, but rather of the cumulative effect of the stimulation of certain glands which throw their secretion into the blood stream. It is known that such effects as this may increase from generation to generation.

One need not conclude that the fangs and claws of the great cats or the hooked beaks and sharp talons of the hawks were necessarily made for seizing and feeding on flesh. There might well have been some kinds of foods in the original creation that were adapted to their needs. On the other hand there are some creatures about which it would be well for us not to be too sure. For example, how a bat or a swallow could live on anything except flying insects is hard to imagine. Either we must allow for a great degree of change in their structure or habits, or else believe that God allowed them insect food. Some of these problems we cannot solve, and we might as well be satisfied to leave them unsolved.

When one sees the skeletons of prehistoric animals, he is forced to believe that there existed before the Flood a number of kinds that arose from a distortion of the originally created types. There were huge animals whose ill-shaped proportions violated all laws of symmetry and beauty. Of some of these it is hard to believe that God pronounced them "very good." One has only to read a book on fossil amphibians, reptiles, and mammals to find many such examples. "Nature," or satanic power working through nature, appears to have performed many experiments in animal breeding.

PARASITES

Some most remarkable adjustments between animals have produced parasites. One of the best examples of parasitic adaptation is seen in the common tapeworm. There are several kinds, with similar life histories. As an example let us study the pork tapeworm. This parasite has lost nearly all its organs except its reproductive and excretory systems. Attaching itself to the intestine walls by hooks and suckers on the "head," it grows a series of segments, sometimes several feet in length. Its food is absorbed from the contents of the intestine in which it lies.

As the segments at the end of the tapeworm mature, they break off and pass out of the body. They then disintegrate, liberating the eggs contained within. These eggs are picked up by the pig, and when the shells are digested by the intestinal juices, hooked larvae are liberated. These larvae burrow into the blood and lymph vessels and are carried to the muscles, where they become enclosed in cysts. In this stage they are known as bladder worms.

When the pork is eaten, the bladder worms are released, attach themselves to the intestinal wall, and begin to grow into other mature tapeworms.

The life cycle of the bookworm is somewhat similar. Hatching in the soil, the larvae climb to the top of projecting particles of earth, where they remain with their forward ends waving until they come into contact with the bare skin of a human being. Then they burrow into the skin and travel through the blood stream to the lungs, whence they migrate into the air passages and to the throat. They are swallowed, and pass to the intestine, where they attach themselves to the walls and live on blood drawn from the intestine walls. When mature, they lay their eggs, which pass out and hatch in the ground, thus starting the cycle over again. This is only one case of complicated relationships that have been set up. Plainly these were not

intended in the beginning.

Scores of other complicated parasite life cycles might be given, but they all illustrate the same principle of degeneracy.

Many examples of perverted instincts may be observed in nature. The wild animal that kills for pleasure is certainly not following any law of nature implanted by the Creator. On all sides we witness death and destruction as the result of lawful instincts that have been turned into wrong channels.

SOME UNSOLVED PROBLEMS

Our concept of a "perfect" world in which no creature ever killed another for food is a beautiful idea, but it must be admitted that there are some problems which cannot be solved on this basis.

The bats are insect-eating animals. Their mode of food taking, the nature of their teeth, and all their habits fit them for this way of life.

Woodpeckers are fitted as a group for drilling in trees and digging out the grubs. While a few of them eat some acorns, few of them seem to be able to live on anything but insect life.

The same is true of a large number of our insect-eating birds, such as warblers, vireos, etc. Their beaks are not adapted to eating seeds. Possibly they might eat fruit, if the right kinds were provided, but at present they are perfectly adapted to an insect diet.

A great number of sea creatures can live on nothing but the floating life-plant and animal mixed-which comes to them in the water. The whalebone whale, for example, strains the floating material from the sea water.

Even among the plants there are some that capture animals for food. The pitcher plants are ingeniously constructed so as to lure and entrap unwary insects, which are digested in the fluid at the bottom of the hollow leaves. In this manner the plant is furnished with nitrogenous food. The sundew and Venus's-flytrap catch flies on the surface of the leaves, which fold up and hold them until they are digested. It is hard to understand how these plants came to possess these habits unless they were originally built for this kind of life.

After all, the distinction between lower forms of animal life and plants is difficult to make. Even in such complicated forms as the insects, what is a grasshopper but a kind of animated bit of grass, as it were? Simply because God created it with a digestive and nervous system, is there any good reason for assuming that it was supposed to be eternal?

Some of these problems we may not be able to settle to our satisfaction, but it is wise to be cautious about taking any dogmatic position with respect to them. We do not fully understand God's original plan and would do well to be conservative in forming positive opinions on such problems as we have mentioned.

6. To Destroy the Earth

WHATEVER the conclusions regarding the origin of species, the attention is always directed to the geological question, as the rocks of the earth are generally regarded as showing abundant evidence for long ages of time in the past. But this common opinion does not harmonize with conditions that one actually finds in the rocks. On the contrary, the clearest revelation given by the rocks of the earth is the fact that the Flood was accompanied by violent wave action, beyond anything known in historic times. A few examples will illustrate the point.

The surest way to learn the nature or cause of any past action is to look for the effects of that action. Today we can tell quite definitely whether a great catastrophe has been caused by earthquake, fire, flood, tornado, tidal wave, or bombing. Each agency leaves its characteristic marks. So, in studying the nature of the rocks of the earth, we may learn much regarding the nature of the forces that produced them.

No person with ordinary powers of observation can study the rocks in their natural location without being forcibly impressed with the idea that present forces at work in the earth are in no way comparable to the forces that must have been at work in the past. The scattered and irregular distribution, the twisting and tilting, the stupendous carving and upheaval of the rock formations seen in any mountain region, point to violent action far surpassing anything that men know today. It is not surprising that the

Creation Speaks

early investigators of the geological formations found in the story of the Flood an explanation for the conditions which they found in the earth.

Any candid consideration of the question of evolution must give attention to the alternative method, that of direct creation, and to the scientific aspect of the Genesis record. Although the theory of uniformity has been generally accepted, the fact remains that in the narrative of Genesis is another explanation which is worthy of careful study. In the present knowledge of scientific truth there are many facts that go to show that the scientific evidence for the Flood is much stronger than has commonly been acknowledged.

In the following paragraphs are given a few of the facts from geology which have led to the conclusion that forces acting in the past have not been operating in the "normal" manner in which we observe them acting today.

The great masses of stratified rocks appear to have been laid under conditions entirely different from those now prevailing in the ocean. Studies on the ocean floor reveal the fact that there is a world-wide distribution of soft ooze made up of the shells of microscopic plants and animals. Nowhere, except possibly in a few scattered localities, is there any large amount of sand, gravel, or clay mud with rich and varied animal life to produce anything having even the slightest resemblance to the great fossil beds found in the rocks.

Nor is there anything resembling the extensive deposits of shale, sandstone, limestone, and the like, which often have no appreciable amount of fossil material.

SUDDEN DEATH

There is nothing on earth today that in any degree approximates the vast array of animal life once existent. We live in a "zoologically impoverished world." Whole orders of animals have been exterminated suddenly and without any known natural cause. Vast numbers of creatures from lowly shellfish to lordly mammals of the dry land have completely disappeared. The present life of the earth is meager and of comparatively minor significance when placed by the side of that which once populated the earth. Were all that now covers the face of the earth to be buried in sand and mud, there would be produced but a fraction of what we find in the rocks as remains of the past. It might be well to notice a few examples.

In many of the lower sedimentary rocks, the trilobites were the dominant animals. These creatures looked somewhat like sow bugs, but each had a prominent head shield. One authority informs us that they were so abundant that we can now piece together their life history, from the remains, almost as accurately as if we had them in the aquarium for observation. Many different kinds are known-crawling, swimming, etc. They ranged in size from one third of an inch to two feet in length.

Of all this vast array not a single specimen has remained alive. The whole group became exterminated suddenly. Many of them are found rolled tightly, as if they had died of suffocation.

Another group, the echinoderms, including starfishes, sea urchins, and sand dollars, once contained a great number of strange forms now unknown. Among these the crinoids, or sea lilies, were the most abundant. They usually possessed stalks from six to eighteen inches in length, although one species had a stalk fifty feet long. Their broken stalks have accumulated into vast limestone many feet thick and extending for hundreds of miles. Here again is evidence of an animal occurring in abundance beyond anything now known, but suddenly buried.

In ancient times mollusks were among the most abundant of land and water life. This is shown by extensive shell beds among the rocks. The ammonites, which were coiled like goat horns, are found so commonly in some parts of Texas and Oklahoma that they are used to decorate the tops of stone walls and to place around flower beds. It is a puzzle, the geologists tell us, why these creatures died out so suddenly. Although once the most abundant of their kind, today they are represented only by the comparatively rare squids and cuttlefishes. Scientists can give no satisfactory explanation for their extermination.

EXTINCTION OF HIGHER ANIMALS

The fishes were once more abundant and varied than now. Of one group, the Scottish geologist Hugh Miller describes their remains in an area 100 miles across, where the rocks are strewed thick with them. They exhibit all evidences of violent death. The fins are contorted, the body curved about so that tail and head nearly touch. The spines stick out as in a fish that had died in convulsions.

Speaking of the red sandstone of Britain, Miller comments on the peculiar fact that they show an amazing abundance of another type of fish which disappeared suddenly and completely from the face of

the earth.

The reptiles present one of the most interesting groups of ancient animals, with variety unknown in historic times. The most remarkable are those with mammal like teeth. They were active, running animals that resembled a modern wolf or marten. Others varied in size from that of a rat to that of a hippopotamus. The larger ones had a horny beak like that of a turtle. Certain extraordinary reptiles were as much as eight feet long, with a great frill of bony spikes along the back, each spike sometimes equipped with side spikes like yardarms on a ship's mast. The dinosaurs themselves had almost as many different forms as all the land mammals together. They differed from one another as radically as a giraffe from a rat or an elephant from a lion.

Some dinosaurs were adapted to the open plains, and ran on two legs with the tail outstretched; others hopped like a kangaroo; others lived in the trees. The carnivorous types were very large, the huge tyrannosaurs standing with heads twenty feet in the air. These were provided with vicious claws on the forearms and huge teeth that were adapted for tearing flesh. Some of the vegetarian dinosaurs reached tremendous bulk, as great as thirty or forty tons. The sauropods were long-necked creatures that lived in the water like hippopotamuses and used their long necks to browse on the bottom or to lift the head to the surface for air.

Space forbids further mention of the many variations found among ancient reptiles. The problem of most particular interest is their sudden disappearance. Geologists speak of this phenomenon as "the most dramatic and in many respects the most puzzling event in the history of life on the earth." There is no way, they declare, to explain how the dinosaurs became extinct.

The same story is repeated with the mammals. In ancient times the earth was populated by vast numbers of mammals that are now largely extinct. Whole series of strange animals roamed the earth, among which were the titanotheres, huge rhinoceroslike creatures. Hyracotheres, like horses; giant pigs; even-toed ungulates resembling modern deer, cattle, and antelopes. Great dogs, wolves, and the saber-toothed tiger; series of camels; and in the water many queer forms, including the zeuglodon, a whale like creature seventy-five feet long. Literally hundreds of extinct types are to be found in the rocks, and one has only to visit a collection in one of our large museums to be filled with astonishment at the remnants of ancient life that he sees there displayed.

Like the extermination of the reptiles, that of the mammals is a profound puzzle to the geologist, an unexplained mystery.

Osborn lists the following groups of animals that were suddenly exterminated from North America: camels, llamas, horses, tapirs, mastodons, elephants, giant sloths, and the Glyptotherium, a huge creature like an armadillo. Speaking of this extinction he says:

"It would be natural to assume that extinction was directly brought about by the profound changes of temperature and moisture, accompanied by changes in the fauna and flora consequent upon the great geologic and physiographic changes of glacial times; but this simple explanation is beset with many difficulties and contradictions." - H. F. Osborn, *The Age of Mammals*, page 500.

BURIED MAMMOTHS

Sir Henry Howorth in his voluminous work, *The Mammoth and the Flood*, has given an almost exhaustive discussion of the distribution of the bones of mammoths and other large animals. The following paragraphs will give a brief synopsis of his main points, which are derived from the reports of fifty or more travelers, besides official reports of the Russian government.

The area with which most of his discussion is concerned begins from the Arctic islands north of Russia and reaches eastward across the Bering Strait into Alaska. The great Siberian plain is low and flat, and the mud is frozen most of the year. When the summer sun melts the mud banks along the rivers, the bones of gigantic animals appear, and sometimes whole bodies, not decayed.

One of the New Siberian Islands, a small one of fifty square miles, is composed almost entirely of fossil bones. One traveler counted ten elephant tusks sticking out of the ground in half a mile, and this condition was general. Besides the elephant bones, there were bones of rhinoceroses, horses, bison, oxen, and sheep. The soil of other islands is said to be composed of practically nothing except the partly decayed bones of animals.

The whole coast line of Siberia is said to have elephant remains embedded in the strata. Wherever rivers have cut through the muddy deposits, these same bones appear in enormous quantities for miles back from the shore.

Creation Speaks

Along the Yenisei River, says one writer, the mammoth bones which fall out of the cliffs are so numerous that on decomposing they form a substance known as bone glue. The natives living along these rivers make a business of collecting the ivory. Since A. D. 600 a regular ivory trade has been carried on with China, Arabia, and Europe. The number of tusks thus brought into the market must have been tremendous, for in one period of twenty years, Howorth says, not less than 20,000 elephant tusks were taken from one locality alone to the European markets.

Along some of the Siberian rivers the sides and bottoms are lined with bones and teeth. Where the Lena empties into the Arctic the bones pile up like driftwood. In some places in that region the ground seems to consist almost entirely of mammoth bones.

The number of animals involved in these great burial grounds is enormous. Some have estimated that more than 5,000,000 mammoths alone met their death in a great cataclysm, to say nothing of the other animals. One explorer reports that there is not in all Russia, from the Don as far as the Chukotsk peninsula, next to Alaska, a river or stream on the banks of which or in the beds of which there have not been found bones of elephants or other large animals.

The suddenness with which some of these animals were overtaken by disaster is indicated by the fact that in the northern part, where the ground is always frozen, the red meat is preserved, and is readily devoured by dogs. Whole bodies are found in perfect condition, with the eyes retaining the glassy stare of sudden death, and identifiable vegetation in the stomachs.

Almost identical conditions prevail in Alaska. Gold-dredging machines excavate the bones of lions, elephants, mastodons, horses, bears, bison, moose, and other animals.

Similar evidences of sudden death are found in other parts of the world, although the warmer climates do not allow such a degree of preservation. Remains of elephants have been found in abundance around the North Sea.

In Tuscany, Italy, a chalk cliff is filled with the bones of elephants, hippopotamuses, rhinoceroses, hyenas, and other animals. In Sicily hippopotamus bones have been quarried for making charcoal for the refining of sugar. In one heap of these bones, it was estimated, 2,000 creatures were represented. Similar conditions are described from America, India, New Zealand, and other regions.

The picture of the extermination of the ancient life types is impressive when viewed as a whole. Let us imagine the whole series of fossiliferous rocks piled in a single column, as they are named in popular geology.

The geologist, interpreting his findings on the theory of uniformity, is puzzled to find that Cambrian trilobites should disappear suddenly, that echinoderms which were so abundant in paleozoic "times," should so nearly disappear from modern waters, that mollusks, so abundant in Paleozoic and Mesozoic waters, should be so comparatively scarce today, that great groups of Paleozoic fishes should disappear suddenly, that Mesozoic reptiles and Cenozoic mammals should come to extinction without any apparent reason.

One who is inclined toward the catastrophic interpretation of geology, and who regards the geologic column as a series of deposits representing, the burial of the ancient life zones of the earth by an overwhelming catastrophe, finds in these sudden extinctions exactly what he might expect. In other words, if the ancient world with its array of life arranged in various zones in the sea and on land were to be overtaken by a great flood of waters, there would be formed a succession of fossil-bearing rocks, each with its peculiar types of life, and with comparatively little mingling of one type with another. The puzzle that the geologists find so confusing becomes clear as a picture when studied in the light of the Scripture statement: I will destroy them with the earth." Genesis 6: 13.

ANCIENT FORESTS

What has been said of animal life is equally true of plant life. The great forests of the so-called "coal age" have gone completely. They are represented today by a few small and comparatively insignificant types of vegetation. Coal beds underlie hundreds of thousands of square miles of the United States alone, to say nothing of other countries. These beds are from a few inches to several feet in thickness. When it is remembered that one foot of coal requires at least ten feet of vegetation, some idea may be obtained of the immense mass of material involved. Nowhere on earth, unless it be in the dense tropical jungles, is there enough plant growth to supply this amount of vegetable matter.

If one were suddenly transported to the ancient forests from which the coal beds came, the surroundings would be so different from the world of the present that it would in some cases be hard to

believe that one were not on another planet.

One of the first plants to be seen would be the giant club mosses rising straight and slender for 100 feet or more. The crown of branches at the top ends in spore-bearing cones a foot or more long. The seal trees have long leaves that leave their imprint like a seal on the stem when they drop away. The Cordaites attain a height of more than 100 feet, and have grass like leaves. Treelike seed ferns are abundant, and some of them bear seeds as large as hens' eggs. The giant rush, or horsetail, grows to a height of sixty feet, and resembles in many ways the modern scouring rushes, except for its immense size. On the ground innumerable creeping liverworts and mosses form a green carpet. Such is the fantastic scenery as one views this ancient "swamp forest."

But not all the forest is of this type, for on the uplands are trees much like present species, such as poplars, walnuts, magnolias, pines, oaks, breadfruit, figs, cinnamon, and scores of temperate zone and semitropical trees.

The most remarkable fact regarding these ancient forests is the evidence for a world-wide uniform climate, as shown by both plant and animal remains. Dinosaurs were abundant in New England, and in Alberta as far north as latitude 58 degrees. Palms and alligators were common as far north as the Dakotas. Cycads, magnolias, and figs grew in Alaska. The ancient world was vastly different in many respects from that with which we are familiar.

FORMATION OF COAL

Geologists have pictured the swamp forests as vast peat bogs that covered much of the earth's surface for millions of years. The slow accumulation of the leaves and stems of the bog plants is given as explanation for the formation of a coal bed. Certain data support the idea that these forests were, without doubt, growing under conditions of abundant soil moisture and humidity. The structure of the ferns and club mosses would lead to this conclusion. But other facts present serious difficulties to the peat bog theory of the formation of coal. For one, there is no single bog or swamp in existence today that could supply enough peat to make a large coal seam.

The difference between this situation and that which existed in the ancient swamp forests is noticeable as we compare them. Coal beds vary from a fraction of an inch up to 30 or 40 feet, and sometimes these figures are greatly exceeded. It requires from 5 to 15 feet of vegetable matter to make a foot of coal. This means that from 100 to 300 feet of material must have accumulated (on the average) in each coal field. These coal fields cover more than 300,000 square miles in the United States alone. The coal fields of the world contain, according to careful estimates, more than seven million tons of coal.

It was once thought that the plants forming the coal were swept together from great distances, but few hold that opinion today. The fact that little mineral matter is found mixed with the coal forbids such an explanation. On the other hand, the nature of the material between the coal beds shows evidence of strong currents. Upright trees are found in coal beds, in some cases extending through several layers of coal and their intervening sandstone. One case mentioned by Lyell was that of a trunk with a diameter of more than 5 feet, some 60 feet long, and extending at an angle of about 40 degrees through more than 10 distinct beds. Sometimes trees are standing head downward. All of these facts indicate that the matter was not accumulated in a normal manner.

The coal beds present a remarkable alternation of coal beds and interbedded shales and other rocks. In some mines such alternations occur from 75 to more than 100 times.

Huxley estimated the length of the carboniferous period at about 6,000,000 years. "How is it that during all this time, the particular plants growing in these localities remained constantly the same, not only unchanged in general aspect, but practically unchanged even in genera and species? Whenever in our modern world a region of spruce or pine forests is completely burned over and destroyed, the next growth is almost certain to be some entirely different kind of vegetation, such as maple or birch. In Denmark, three or four such successive forests have occupied given localities within quite modern times, while in New Brunswick and Nova Scotia, as Dawson has shown, a complete change of this character has occurred over and over again within a single generation. But strange to say, during all these uncounted millions of years (?) of the 'Coal period,' while the country was being 'desolated again and again, either universally or partially, by the returning waters, and over the large submerged areas kept desolate for many centuries or series of centuries again and again' (Dana, Manual, page 666), the vegetation continued ever the same, the very same plants being found in the upper beds as in the lower, and practically identical the whole world

Creation Speaks

around, wherever the Carboniferous rocks have been discovered, whether in North America, Europe, Asia, South Africa, or South America. Surely this is a very strange inconsistency which this theory compels us to believe in." - George McCready Price, *The New Geology*, pages 461, 462.

VIOLENT WATER ACTION

The nature of the sedimentary rocks indicates violent water action far surpassing anything ever observed in our day. For example, the deeper sediments in the Gulf region show evidence of immense volumes of water sweeping northwestward across a small sea. The higher deposits indicate a reversal of the currents with great waves carrying sand, gravel, and clay southeastward across the deeper sediments. These currents were of such vast extent as to sweep the materials forward for several hundred miles. Finally, on top of all the rest, fine sands and mud occur along the whole Gulf coast from Louisiana nearly to Mexico. These appear to have been deposited by a series of rivers of such volume that their flood plains coalesced into one extensive delta not less than three or four hundred miles across. There simply is no such phenomenon known anywhere in the world today.

The following, from a well-known authority, is suggestive:

"Floods of water were poured down the drainage lines, filled the valley, and spread out over the flat coastal plain. Cobbles up to six or eight inches in diameter were transported a hundred miles or more, were rounded, and left as evidence of the force and size of the floods. A widespread alluvial apron of sand and gravel was spread over the land. In Mexico boulders a foot or more in diameter and transported many miles from their source are common. Some of the quartz pebbles can be traced back to outcrops in the mountains of west Texas and New Mexico. The only hypothesis adequate to explain the widespread sheet of gravel is floods of water. The floods were terrific." E. H. Sellards, *Geology of Texas*, volume 1, Page 784.

Conditions similar to these are described over and over again by Sellards, and from practically every depth of deposit. They indicate continued violence of stream and wave action from beginning to end of the geological series. The original mass of material, he informs us, to form only the upper, or "Cenozoic" deposits, was equal to a mountain mass 300 miles long, 20 miles wide, and 5,000 feet high.

Other formations in Texas, as well as throughout the Midwest, speak of the same extensive action far beyond anything known in modern times.

The Uvalde gravels are scattered over the upland surfaces of much of central and southern Texas. They consist of gravel composed almost entirely of rounded flint cobbles with pieces of limestone and quartz and flint pebbles set in a chalky matrix. Most of the cobbles are less than an inch in diameter, but many measure up to 3 or even 6 inches. The material is well assorted and distinctly cross bedded. The thickness of the gravel deposits ranges from a very thin covering to 25 or 30 feet. The average thickness is probably from 15 to 20 feet.

Exhibits in museums illustrate the violence which must have accompanied their deposition. In the Harvard Museum a slab 6 x 10 feet taken from the Agate Spring fossil quarry near Harrison, Nebraska, contains the bones of Diceratherium Cooki, a type of rhinoceros, all jumbled together in a mass and filled with soft sandstone. They are so thickly packed and in such a confused mass that they never could have been left in that condition by mere decay of the bodies. No ordinary decay could have left the bones in such a jumble, and no amount of breakage could have pulled the bodies apart so thoroughly. They must have decayed and then have been washed together in masses.

From the La Brea tar pits, Los Angeles, has been taken one of the most remarkable collections of prehistoric animals in the world. Among them are imperial elephants, larger than any now living, mastodons, wolves, saber-toothed tigers, horses, camels, bears, sloths, cats, and many kinds of smaller animals and birds. These bones are not in anything like natural position, but are piled in jumbled masses, and many of them are badly crushed and broken, as if they had been churned together.

In the "High Plains" of the United States the deposits appear to be the remnants of a great fluviatile plain, laid down by overloaded streams after the manner of alluvial fans, and "braided."

These deposits lie in sand and gravel bands having crooked or winding courses with a west-east direction, and extending to depths of as much as 500 feet before the underlying shale or limestone rock is reached. The appearance indicates that great erosive forces carved the general contour of the rocks, after which vast streams of water, overloaded with sediment, built up the alluvial plains above the eroded surface. Normal conditions would not produce this situation. Violent water action is required to spread this sand and gravel so widely and so thickly.

EXTENSIVE SEDIMENTS

Violence beyond anything now known is not the only problem presented by geological studies. In Oklahoma the Arbuckle limestone is a massive dolomite 6,000 or more feet thick. One measurement near Ardmore gave 7,992 feet. This is only one example of the problem presented to the geologists by the massive limestone. Here is a mass of solid lime rock thousands of feet thick and hundreds of square miles in extent. It is not of reef origin, nor can it be explained by any known process now going on in the oceans. Its origin is a mystery, as is that of the great majority of the lime formations.

In the Spring Mountains of southern Nevada 16,000 feet of sediments are reported, the upper 5,000 feet being mostly limestone. In other localities thousands of feet of limestone are found. Uniformitarian geology fails to account for these. Geologists speak of a time of limestone making on a great scale, when the Niagaran series of rocks was deposited. Certain members of this series stretched southwestward for nearly 1,000 miles, to Wisconsin and thence across Illinois, Iowa, Missouri, and western Tennessee. In Manitoba and the region west of Hudson Bay indications are that probably this series extended to the Arctic shores and islands.

The Niagaran series of limestone and several others in the eastern United States are largely made up of corals, and in some places distinct coral reefs may be observed.

Next above this great limestone formation comes one of mixed marls, shales, gypsum, and rock salt. This series, the Salina, is remarkable for thick conglomerates of quartz pebbles which extend along the Appalachian line to Tennessee.

Other immense limestone formations extend over great stretches of country. The Onondaga limestone is found from the Hudson River into Michigan, and, like the Niagaran, is largely of coral origin.

In other places, as in the Appalachians, great beds of gravel can be traced for a hundred miles or more. These are composed of coarse materials laid down in thick masses where they first emerged from the lands from which they were washed, but becoming thinner and finer as they spread out into the shallow sea in which they were deposited.

Vulcanism on a tremendous scale has taken place in the past. The Columbia lava plateau occupies 50,000 square miles of territory in Oregon, Washington, Idaho, and Nevada. Here lava flows occur to depths of several thousand feet. The gorge of the Snake River on the border of Oregon and Idaho is cut through more than a mile of solid lava. The Deccan plateau of India covers a comparable area. In the Lake Superior region are 20,000 cubic miles of material that was forced up from below in a molten or semi molten state. The great masses of the Coast Ranges of Western America, the bulk of the Andes, and the scores of several other great mountain areas such as the Sierra Nevadas, the Rockies, and the Alps either originated from magmas or contain much material that has been plastic or molten. Vulcanism seems to have accompanied mountain making everywhere on a large scale. Today it is mild and feeble compared with its ancient manifestations.

Glaciation in ancient times has been much greater and more extensive than at present. In all the high mountains of the world one may find evidences of large-scale glaciation. In Yosemite the ancient Lyell and Merced glaciers were about 2,000 feet in thickness and flowed as far as the foot of El Capitan, approximately thirty miles from the present ice on the summit of the Sierras and 8,000 feet lower. In the Alps the ice streams extended as much as forty miles beyond their present positions and not less than 4,000 feet lower. Similar conditions existed in mountain regions elsewhere.

As to so-called "continental glaciation," while some may not regard continental "glaciers" as true glaciers, yet there is abundant proof that great thickness of ice accumulated over parts of North America and Europe, and that in some parts of the ice-covered area there was sufficient movement to leave definite markings in the rocks. This widespread accumulation of ice appears to have followed the period in which the sedimentary rocks were deposited. When viewed in their broader aspects, these facts form a striking corollary with the Flood theory of geology, and demand catastrophic rather than uniformitarian interpretation.

Earth movements on such a scale as to stagger the imagination seem to have been involved in the building of the great mountain systems of the earth. Several facts along this line may be fitted together into a picture that presents a view of a catastrophe so universal in scope and so immense in its action that some of the obvious records from the rocks appear to be too much to believe.

Not only have all mountain regions been greatly deformed, but wherever any sediment is cut through by erosion, there appears beneath it an intensely deformed substructure.

Geologists recognize that the mountain belts of the earth have been acted upon by great movements that were world-wide in extent, and affected all continents at the same time. This applies to the submerged areas as well, for disturbed mountain masses disappear beneath the water and reappear sometimes hundreds of miles away.

These deformations consist of folds and faults, and give evidence of terrific forces which today are unknown. Many theories have been advanced to account for them, but none are satisfactory. The one that comes nearest to explaining these earth movements is the theory that they were carried by irregular rotational action of the earth as a whole. In this we find a suggestive idea, one which fits in well with the Flood theory of geology.

7. A Flood of Waters

THE facts which have just been considered have shown us clearly that the rocks of the earth must have been produced by violent action, and not by slow, uniform action through long periods of time. We are now ready to study the problem of the cause and the nature of the great catastrophe by which the ancient world was overwhelmed. But what can we know of the antediluvian world? And what good would it do us to know? These are legitimate questions which doubtless arise in the mind of nearly everyone who believes in the literal Genesis record.

Let us suggest an answer to the latter question first, for it is simple. Practically all the facts of geology have been interpreted by scientists in terms of long geological ages. It is therefore almost impossible to read about or discuss geological matters without meeting the idea that there have been immense periods of time during which the stratified rocks were deposited. It is not sufficient for the diluvialist to merely deny the validity of the evolutionary views. Unless that denial is accompanied by facts which will show the scientific accuracy of the literal Genesis record, nothing will be accomplished by raising objections to the popular ideas. In other words, it becomes necessary for us to present to the world a positive scientific literalism if our views are to influence anyone beyond our own immediate associates.

A second reason for attempting to learn something about the world as it was when it came from the hand of the Creator is that we can thereby understand better the nature and extent of that great catastrophe by which it was destroyed.

ANTEDILUVIAN GEOGRAPHY

The ancient waterways were probably in the form of long, narrow seas forming a network over the earth. The basis for this conclusion is the fact that the deepwater fossils are found distributed in such a manner. The geologists have called these ancient seas "geosynclines," and while we may not agree with all the details of the interpretation that they place upon this phenomenon, we may quite readily see in these lines of deposits a remnant of the ancient geographical distribution of certain forms of life.

Certain other areas, such as the great plains of the Midwest, the steppes of Russia, the vast stretches of the Sahara, and other like areas where thousands of feet of horizontal strata have been deposited over thousands of square miles, appear to be remnants of ancient lowlands which were buried by sediments washed from the highlands. They apparently contained both land and water areas, as fossil remains indicate.

Still a third feature seems to be clearly indicated. In many parts of the world the "shields," huge blocks of crystalline rocks, give the impression of being the remnants of higher land masses whose greater portions have been removed to furnish the material for the sediments that filled the basins and covered the lower lands.

While these suggestions must be understood as being somewhat speculative in nature, yet they offer to us a fairly comprehensive background upon which we can build an intelligent understanding of the processes involved in the Flood.

CAUSE AND NATURE OF THE FLOOD

What caused the Flood? On this point we can say little. Yet it is hardly satisfactory to merely

Creation Speaks

assert: "It was a miracle." Plainly such an event as a world-wide destruction of the earth would be miraculous in that it involved supernatural manifestations of power. But to do no more than to declare the Flood a miracle is to put a stop to all investigation regarding it. For that matter, all processes in nature are miraculous in that they involve divine power. We do not refuse to study them because of this.

A study of the Genesis record of the Flood indicates three periods into which it may be divided. The first is the forty days of rainfall, which is part of the first rise of the waters culminating at the end of 150 days. The second period extends from the beginning until the time when the ark rested on the tops of the mountains. The third period extends from the lodging of the ark until the close of the Flood, when Noah and his family came forth and released the animals upon the dried surface of the ground.

The diagram given below is drawn from the data given in Genesis. The figures are based on a month of thirty days, which is sufficiently accurate for practical purposes. Dates shown indicate the year, month, and day in the life of Noah in which the recorded events occurred.

During the first and second periods must have occurred the destruction of the original land surface. The intense erosion would tear away the lands and wash their materials into the bottom of the raging waters.

During the third period the convulsions of the earth must have increased in violence so as to raise the present land areas above the waters.

The advocates of Flood geology believe that all the major geological features of the earth were produced during this short time, slightly more than a year in duration. On the other hand, popular geology ascribes these actions to long periods of time involving hundreds of millions of years.

Probably the greatest single reason why the world fails to recognize the truth of creation lies in the fact that for 150 years geologists have been building up their data regarding the rocks, and have been interpreting them in terms of long ages, while the creationists have done practically nothing in a scientific way to meet this great aggregation of fact and theory. Creationists have been content to deny the evolutionary ages, but have not met the facts with an interpretation from the creationist standpoint. Let us see, in the next few pages, how some of the geological data can be fitted into the idea of a vast overwhelming Flood instead of into the long-ages theory.

The bottom of the rock formations wherever noted, whether on the "shields," in the bottom of canyons, or beneath the stratified rocks, as revealed by well drilling, always proves to be formed of the "basement complex," if one goes deep enough. This is a mass of crystalline rock which has been twisted, contorted, folded, broken, eroded, and penetrated everywhere by molten matter from deeper down. The suggestion has already been made that a part, at least, of this complex may have been produced during the second day of creation. In any case, its broken nature, and the presence of the intrusive dikes and other bodies that came up through it in a molten state, must be attributed to the violent action of the Flood. The rocking and rolling of the earth must have broken up much of the original "crust," or foundation of the lands, and have produced this 'basement complex.' The disturbance would have generated considerable heat, which would cause melting of the rocks in many places. In some instances it appears that the lower portions of some strata laid down by water action were subsequently melted away from beneath and incorporated into the crystalline masses below.

NATURE OF THE STRATA

The amount of molten matter involved is enormous. In the Lake Superior region alone more than 20,000 cubic miles of molten material came up through cracks in the crystalline rocks. In some the lava was poured out at later stages, after sedimentary rocks had been laid down. Such were the flows of the Pacific where the Columbia lava plateau consists of more than 200,000 square miles of this material. In the Snake River Canyon these lavas are more than a mile in thickness. The Deccan plains of India are of similar size and nature. All in all there is evidence of such terrific vulcanism at this time that it is hard for one to realize the immensity of its activity.

The rocks which are classed as Lower Palaeozoic (Cambrian, Ordovician, Silurian, Devonian, and Mississippian) are made up largely of fine-grained, hard materials spread out in extensive layers, and containing remnants of comparatively simple, sluggish forms of life. Only in the Devonian are any land plants or animals known, and they are few and simple. The Lower Palaeozoic rocks are abundant along the lines of the great network of waterways, the geosynclines already described, and to a limited extent elsewhere. The rocks plainly suggest that originally there existed many channels and scattered seas containing the types of life that lived at the bottom of the waters, where they were buried by fine silt, sand,

Creation Speaks

and limestone washed down from the lands at the beginning of the Flood action.

One of the most interesting geological features is the presence in many of these lower strata of black shale. These are thin layered masses of fine black sediment that appears to have been produced from the destruction of an original soil. This would have been one of the first results of the terrific rainfall at the beginning of the Flood.

The Upper Paleozoic rocks (Pennsylvanian and Permian) show marked contrasts with the ones below them. While there are still many types of simple water life, there appear large assemblages of shore forms and land life. The Pennsylvanian is generally described as a time of huge marshes filled with mosses, ferns, and fernlike trees, among which might be found many kinds of huge amphibians resembling giant frogs and salamanders. The burial of these plants and their subsequent solidification has given rise to the vast deposits of hard coals the world over.

In many parts of the world an extensive series of rocks known as the Mesozoic strata may be found more or less scattered above the Palcozoic rocks. These contain both land and sea life. Some of the trees are similar to those in the Permsylvanian rocks, but there are many that grew on higher and drier land. The amphibians are gradually replaced by reptiles, many of which belong to the land rather than to the water.

Up until the close of the Palcozoic deposition the sediments appear to have been laid down as widespread strata, and to have undergone only a moderate degree of disturbance. But by the time the Mesozoic deposits were laid down, there appears to have begun a series of world-wide upheavals. Huge uplifts threw the strata into folds and broken masses. Many of the mountain areas of the world owe their beginning to the upheavals at this stage of the Flood.

The Tertiary deposits are of a still more scattered nature, often occurring in basins, such as the London-Paris-Belgium basin, the Irrawaddy basin, or the basins of the Rocky Mountain region. It is apparent that much of the material for the formation of the Tertiary beds was washed out from the upheaved strata of previous deposits, although the presence of mammals in the higher rocks indicates the fact that there were yet some places where these animals were able to escape the fury of the storm until the very last.

The closing days of the Flood were marked by the most violent disturbances of all. Not only did the upheaval of mountain ranges continue, with folding and splitting and sliding of huge blocks of the surface, but movements on a large scale took place in order to form the ocean basins. As the waters receded into these basins, the violence of the catastrophe was increased by the breaking out of the lava flows already described. In addition, thousands of volcanoes burst into active eruption, scattering lava and ashes over vast areas of the earth's surface. The combination of upheaving mountain chains, receding ocean waters, tidal waves washing away the newly uplifted lands, the sheets and rivers of lava, and the belching of volcanoes everywhere must have presented a scene that staggers the imagination.

In the last few pages we have presented the interpretation of geological facts from the viewpoint of the Flood. Now we shall consider that which some may think should have been considered first. We shall inquire into the reason why the scientific world has accepted the theory of long geological ages and interpreted all these phenomena in that light rather than in terms of the Flood, as we have done.

GROWTH OF GEOLOGICAL THEORY

The story goes back to the beginning of the fifth century of our era, when the church father Augustine explained creation as having taken place "in potentia," rather than in actuality. In other words, he taught that God did not actually create a finished world. He created the world, Augustine taught, in a simple state, and endowed matter with properties whereby it could develop into a higher state. Thus was brought into Christianity the Greek concept of a universe operating by means of resident forces. The introduction of such a philosophy laid the way for acceptance of full-fledged evolution by the Christians as well as by others.

When modern science began to develop in the seventeenth and eighteenth centuries, it was based on this evolutionary mode of thought. Therefore by 1800, when the science of geology really began, the scientists were so given over to the Augustinian doctrine that they seemed never to have given any serious thought to the possibility of any other interpretation of the past. The Genesis record of creation was assumed to be merely a legend or myth told by Moses to explain the origin of the earth in language that simple, unlearned people could understand. Few, if any, educated men at the beginning of the nineteenth century believed that the days of Genesis were real twenty-four-hour days.

Creation Speaks

The first attempt to explain the origin of the rocks of the earth in a modern "scientific" manner was made in 1785 by James Hutton of Edinburgh. About the same time an English surveyor and canal engineer, William Smith, discovered that certain strata in England always contained certain kinds of fossils. Smith's discovery was called to the attention of the geologists, and they immediately seized upon this fact as a clue to the relative age of the rocks everywhere. Since the layers of rocks represented deposits made during successive ages, they argued, it would be easy to determine the age of the rock by observing the fossils they contained. Thus was laid the foundation for the modern theory of geology in which the fossils are used to classify the rocks and arrange them in order of their supposed ages.

Adam Sedgwick and Roderick Murchison immediately began investigation of the lower rocks of England and Wales. They were able to distinguish four groups of rocks below the coal measures, which correspond to the American Pennsylvanian. After much controversy these rocks were named, in order from the bottom, the Cambrian, Ordovician, Silurian, and Devonian.

An apparent confirmation of their belief that these rocks represented a universal series of deposits was found in the fact that on the continent of Europe and in New York similar series were discovered. The New York system thus became the guide to the identification of the rocks in areas farther south and west, where similar strata occurred. By the middle of the nineteenth century the idea had been quite generally accepted that the sequence of the fossils as seen in England and New York was practically worldwide, and actually represented the successive geological ages.

A careful study of the situation in the light of all that we have already discussed will suggest that the evolutionary interpretation is not by any means a necessary one. Granting that there is a certain degree of similarity between the Paleozoic rocks of England and America, and that the sequence of strata found in these countries is much like that found in several other countries, it nevertheless may be shown that this sequence of certain fossil strata can be explained in another way.

It is a basic principle of science that the unknown must be explained by the known as far as available information will allow. Applying this principle to the interpretation of the fossil sequence, what conclusion would one reach, if he were to judge entirely by the situation he sees in the world around him, and if he were unbiased by any preconceived theory?

In our modern world we find different kinds of plants and animals at different levels, both in the sea and on land. Living creatures are associated together in life zones. It is easy to conclude that in the world as God created it there must have been life zones, for it is quite obvious that if we are to believe in a direct creation by an omniscient Creator, we should find certain assumptions almost unavoidable, among them the following:

1. The earth's surface would be diversified by mountains, plains, lakes, seas, and streams at different levels.
2. These diverse ' features would be the home of many different types of plants and animals.
3. These plants and animals would be grouped in communities according to their individual adaptations to the varying environmental conditions, and these communities would, in their broader aspects, constitute the major life zones.
4. The adaptation of plants and animals to the environment would be much more exact than at present, inasmuch as the Creator, according to the Divine Record, pronounced it "very good." There would be a close correlation between structural features and zonal distribution.

5. There would be a much more complete series of life forms than now exist in our present world.

With this in mind, we can readily see how the orderly arrangement of the stratified rocks can be interpreted as remnants of the ancient zones or provinces that were broken up and destroyed by the Flood. This is made possible by the fact that in the Flood the waters rose gradually over a period of five months rather than sweeping over the lands all at once. This gradual rise of the waters and the progressive destruction of the zonal system of the original life of the earth laid down the ascending series of fossil bearing rocks. Had the men of 150 years ago realized this truth, geological theory would have had an entirely different history than it has had.

This "ecological zonation theory" is suggested as a substitute for the popular theory of long geological ages. A complete discussion of this theory appears in the author's larger work. (H. W. Clark, The New Diluvialism, Science Publications, Angwin, California, 1946.

8. After the Flood

AS Noah and his family came forth from the ark, the sight that met their eyes must have been strange indeed. The ragged surface of the soaked earth bore little resemblance to the beautiful world they had left when they had entered the ark more than a year before. But if they could have seen the earth as a whole, as the geographer and the geologist sees it, they would have marveled still more at the changes that had taken place. The surface of the earth had been so modified that no trace of the old familiar landmarks remained. Instead, new continents had arisen, with vast stretches of wide ocean between them. Great delta plains marked the mouths of huge swollen rivers, and barren stretches of drying earth gave rise to immense clouds of dust as the winds swept over their wild expanses. Chains of volcanoes threw their ashes and cinders into the air, and the clouds of dust obscured the sun as they drifted out over the landscape.

The closing days of the Flood had been marked by the most stupendous of all its terrifying activities. As the mountains had arisen and the seas retreated, the basins left everywhere were full of thick mud in which floated the mangled, disintegrating bodies of men and animals. To allow this mass of debris to lie unburied would be to fill the earth with vile refuse and a stench that would make it totally unfit for habitation. And so, as the very last act in the prolonged drama, there came a mighty rushing wind, accompanied by the force of rolling tidal waves that swept over the lands. The force of the wind was so great that it picked up the dust and earth in huge clouds, it scooped out the mud and bones from the hollows, it carried away the jagged tops of the hills, and mixing mud, sand, bones, and rocks together in one heterogeneous mass, drove the sticky, gummy mixture along as if it had been forced from some huge nozzle. The tidal waves that accompanied and followed the wind spread the cement like mass far and wide, over rocks and hills and across valleys. Valleys were filled, and in places the rivers were dammed up and their courses changed.

What is the evidence for all this? In any geology textbook one may read about the "drift" or the "till." This hardpan, as it is commonly called, is adequately explained only in terms of the great wind spoken of in the Flood record. The geologists have entirely overlooked this cause for the drift, for in their uniformitarian theory there is nothing to suggest such wind action. But the record is there in Genesis, and when we apply it to geological problems we find that the explanation it offers for the drift is strikingly simple and easy to understand.

CAUSE OF THE ICE AGE

The climate after the Flood must have been much different from what we know at present. The interior basins, occupying one fifth of the land surface, would have been full of water. By this means the climate would have been made much cooler and damper than now. The vast extent of volcanic activity would have increased the cooling effect, because of the clouds of dust continually added to the fog and clouds already present. Also, the eruptions would have thrown vast quantities of water vapor into the atmosphere. The lava flows, still hot from their recent extrusion from the earth, would rapidly evaporate any water that came in contact with them.

With these facts before us, we can readily comprehend how there would have been rainfall and snowfall hundreds of times as great as now. The summers would be so short and so cool that in the northern lands the snow could not melt off before winter came again. Thus there would have taken place a gradually increasing thickness of snow and ice, not only in the mountains but also in the lowlands. The effect of the accumulation of ice would be to set up anticyclonic winds, which, blowing outward over the ice would cause still further deposit of snow along the margins. In this way a literal ice sheet, popularly known as a "continental glacier," would develop.

Geologists describe the last of the "geological periods," the Pleistocene, as the glacial period, and postulate four main successions of ice, with warmer periods in between, the whole occupying about 100,000 years. But a careful study of the so-called glacial debris indicates that the first three "glacial" ages can be attributed to the wind and the wave action accompanying it at the close of the Flood. The fourth glaciation is the only one that partakes unquestionably of the nature of true ice action.

The evidence for this conclusion lies principally in the fact that the lower drift," commonly attributed to the first three divisions of the glacial period, is not of the nature of true glacial debris. In many ways it resembles water deposit rather than ice deposit. On the other hand, the fourth division shows true glacial evidences, very much like those seen in any modern glacial region.

In many parts of the world are deposits of loess, or wind-blown dust, on top of the rocks and the glacial debris. The loess covers much of the hill country east of the Mississippi, is found in widely scattered areas in central Europe, and is hundreds of feet deep in western China. A person can easily understand how in the days following the Flood this deposit could have been formed, as violent winds swept unchecked over great areas of barren land not yet covered with vegetation. Especially prominent are the loess deposits around the margins of the glaciated areas, where the fine dust produced by the grinding action of the ice furnished abundant material for the wind to scatter far and wide.

PREHISTORIC MAN

Geologists have tried to portray these early men of the wilderness as primitive ancestors through whom man arose from the apes. From a discovery made in Java and consisting of a portion of a skull, a few teeth, and a thighbone was reconstructed a primitive creature named Pithecanthropus, or the ape man. But although this find has since been supplemented by others of like nature, there is nothing to indicate that it was actually the forerunner of more civilized man. In fact, studies recently made in the Far East, Java, Burma, India, Mesopotamia, Palestine, and Egypt fail utterly to support the supposed evolutionary origin of the early city cultures. It is apparent that both the city civilizations and the crude cave and terrace populations existed side by side.

The Neanderthals and the Cro-Magnons in Central Europe, two races that occupied the country at an early date, seem to have migrated there in order, and to have been succeeded directly by the pre-Roman peoples. There is no evidence for any evolutionary relationship whatsoever.

The Neanderthal race was of peculiar character. Approximately one hundred skeletons, partial or complete, have been found, usually in caves or in camp sites, where they were buried. They were a short people, about five feet in height, with heavy torso and long arms. The most peculiar feature was the heavy ridge of bone extending over the eyes. Nothing like this is known in modern man. The forehead was low, and the cranial capacity somewhat less than in present-day human skulls.

In Europe the Neanderthal remains are found all over the central portion, including parts of France, Spain, Germany, and Austria. Hundreds of thousands of artifacts-flint arrowheads, spears, knives, etc.-have been recovered from their camp sites. These people lived by the chase, as bones of hundreds of thousands of animals are found around their camps.

In many localities the Neanderthal remains are succeeded immediately by skeletons and artifacts of the Cro-Magnons, who were much different in appearance. They were about six feet tall, straight and well-formed, and with high brows and intelligent features. Their tools were of superior quality. In many caves the walls are covered with artistic drawings of the animals of their times. There is every reason to believe that they were migrants that drove out or destroyed the degenerate Neanderthals.

In many of the caves in Central Europe have been found layers of debris with a succession of artifacts. The lower layers are of the crude type used by the Neanderthal race. Following them are the better implements of the Cro-Magnon race. Then come still better tools of bone and copper and iron, sometimes accompanied by pottery. There is a definite succession from the Neanderthals to the Romans.

The evolutionist has assumed that these types of human beings and the layers of debris in the caves represent the evolution of human civilization from the Old Stone Age to the Bronze and Iron Ages of pre-Roman times. But the facts can as readily be explained on the basis of migrating races after the Flood. There is no proof whatsoever that there was any evolutionary sequence among these different races.

The same is true when we consider the civilizations of Egypt, Palestine, and Mesopotamia. In all these countries are found evidence of Neanderthal people who inhabited the margins of the valleys in their earlier times. But there is no proof that there was a Neanderthal period in the cities. The lowest levels of the cities of these countries show a highly developed civilization, with pottery, gold, silver, and copper vessels, bronze implements, etc. The evolutionary interpretation of ancient civilizations completely breaks down when the facts are fully known.

The postdiluvian period not only involved changes in the earth's surface and in human races, but in plants and animals as well. Doubtless some of these changes occurred quickly, while others took place over long periods of time.

MIGRATION OF PLANTS AND ANIMALS

When God first made the animals and man, He commanded them to multiply and replenish the earth. This process had to be repeated after the Flood, but under much different conditions. The surface of

Creation Speaks

the earth was changed, its climatic and soil conditions were different, and living creatures would have to meet many new problems that did not exist originally.

One point should be remembered: The land animals had to spread out from the "mountains of Ararat" where the ark rested, but plants sprang up in many localities where seeds and fragments were preserved. Thus the problems of distribution are much different in the two groups.

Reference has already been made to the distribution of the wolves, foxes, and jackals over the earth. In like manner we can understand how all groups of animals have been scattered abroad, leaving various species along the way.

The nature of the life on oceanic islands illustrates well the way in which life has changed during the centuries.

The Cape Verde Islands, 600 miles from Portugal, have plants and animals like those on the Continent. In like manner Bermuda, 700 miles from North Carolina, has American types.

The Galapagos Islands, between 500 and 600 miles off the coast of Ecuador, have species distinctively related to those of the mainland. However, each island has its own peculiarities, certain species being restricted to certain islands.

The island of St. Helena, 1,100 miles from Africa and 1,800 miles from South America, is unlike either continent. The Hawaiian Islands more than 2,000 miles from the nearest continent, are still more distinct, having the greatest divergence of any.

The effect of isolation in separating species one from the other is seen in a striking manner in Southeastern Asia. In the Philippines, with 30 large islands and more than 3,000 small ones, more than 1,000 species of land snails occur in 115,000 square miles. On the mainland, in Indo-China and Thailand, only 600 species exist in 500,000 square miles.

Where lakes and streams are cut off from contact with others, interesting species changes are observed. The lakes of Ireland and northern Britain have a great variance in trout, each lake having its own peculiar species. In the Kern River basin in the southern Sierra Nevada region of California a lava flow has cut off the headwaters of the stream, so that fish could not ascend from the lower portions. The golden trout in the high part of the basin are different from those anywhere else in the world, but are apparently derived from the same stock as the trout of the lower streams of these mountains.

All these facts fit in perfectly with the Flood viewpoint, and do not require that we accept the theory of evolution in order to interpret them.

The distribution of plant life may be as satisfactorily explained on the Flood theory. One example will suffice for illustration.

The plant genus *Vernonia* is distributed widely over the middle and eastern United States, and consists of several species. There is clear evidence that these have arisen from common ancestry in the vicinity of Texas. One species, *V. fasciculata*, is found in the low wet valleys of the northern Mississippi basin. Another, *V. missourica*, grows on the dry prairies from Texas to Michigan. A third, *V. altissima*, is found in the moist woodlands of the Mississippi and Ohio Valleys and as far east as New York. In much of their ranges these species are isolated from one another and do not mingle. But in the central portion there has been formed *V. illinoensis*, apparently as a hybrid complex resulting from the crossing of the other three. This conclusion has been reached by a comparison of both the external characteristics and the number of chromosomes of the species mentioned.

Here is a case where one original group of plants has migrated from its original home and has split up into several species. Then some of these have recombined to form a new hybrid species. This is probably what has happened in hundreds of cases.

The presence of the marsupials in Australia and of the tapir in South America and Malaya have been the cause of much speculation. However, if we study the problem in the light of the spread of animal life from the region of Ararat, the problem is not so great as is generally supposed. There is no doubt that for a considerable length of time after the Flood there were land bridges between all the continents, except possibly for a narrow deep channel separating Australia from Asia. As the animals migrated in all directions, the groups became separated, and those of intermediate areas were destroyed. This explains the two groups of tapirs. The marsupials probably found themselves unable to compete with their predator enemies in most of the world, but having become established in Australia, they were protected by the water barriers that widened until their enemies could not reach them. One has only to suppose that all animals did not spread at equal rates, in order to understand how the marsupials could become the main inhabitants of Australia, whereas the predators did not become established there.

9. Paganism or Literal Creationism

THE Genesis record is a simple story of creation, step by step, through six Mays.” The question as to whether these days are to be understood as literal days of twenty-four hours each, or as representing long periods of time, has invoked much discussion.

A few Christians, who believe that the Genesis record should be taken literally, define the word days in the same sense as is commonly given to it throughout the rest of the Scripture. Confirmation for this view is seen in Exodus 20:11, where the observance of the seventh day as the Sabbath is enjoined as a memorial of the six-day creation. On the seventh day, we read in Genesis 2:1,2, God rested from His creative work. To be consistent, the same meaning must be applied to the word days in Genesis 1, Genesis 2, and Exodus 20:8-11. To change the meaning in any of these places would do violence to the plain rules of language.

The great majority of theologians, as well as practically all scientists, are influenced by traditional views which are hoary with age, and prefer to regard the creation story as allegorical or figurative, having no significance from a scientific angle. In order to understand this popular belief, and to know wherein it differs from the literal Bible story, we must go back into history and trace the development of modern thought through the ages.

PAGAN IDEAS IN CHRISTIANITY

When intellectual leadership passed from the valleys of the Nile and Euphrates to the northern shores of the Mediterranean, it was the young and virile Greek people who took up the torch of civilization and developed a culture that was destined to spread throughout the modern world. Had Israel fulfilled the high destiny to which God had called her when He placed her in Palestine, at the crossroads of the ancient world, she might have seen her creation doctrine become the background for scientific research for all future time. But Israel’s apostasies deprived her of her glorious privilege of making the true God known to the world, intellectually and spiritually, and pagan philosophy became the foundation for modern thought.

Around the fifth century before Christ there arose in the Greek colonies in Asia Minor a number of philosophers who attempted to find an explanation for the activities of nature. One said that all things were derived from water; another thought that earth, water, air, and fire were the basic elements of nature; still others denied the existence of any material substance, but supposed that all “matter” was merely an illusion. As time went on, the scholars of Greece devised many interpretations for natural phenomena, and their influence was widely felt in religious thought. Their systems of philosophy, however much they might differ, were all alike in one respect, and that was in the fact that everything was explained by some natural cause. Therefore Greek philosophy can be designated as “naturalism,” in contrast with the supernaturalism of the Hebrews, who believed that God was the direct source of power for the operations of nature.

Two Greek philosophers of the fourth century before Christ stand out as especially influential—Plato and Aristotle.

Plato taught that there was one supreme power in the universe, from whom all lesser beings were derived, and from whom all material substance had emanated. Matter, he believed, was not a reality, ‘but only a manifestation of the supreme spiritual power of the universe. It was this Platonic viewpoint that gave rise to the doctrine of the immortality of the soul. Souls, Plato taught, were spiritual entities sent out from God to dwell in the physical bodies that had been created by His power.

Aristotle’s views were in many respects opposite to those taught by Plato. He thought that matter was the foundation of reality, and that it had always existed. By its own inherent properties it had been enabled to develop into a multitude of forms, and by purely natural processes living creatures, mind, intelligence, and spiritual beings had come into existence.

From the Platonic viewpoint developed the Stoic philosophy, which made duty the highest aim in life, whereas the Aristotelian logic gave rise to the Epicurean philosophy, whose principal objective was “Pleasure - eat, drink, and be merry, for tomorrow we die.”

These Greek doctrines are of no value to us as merely historical developments, but rather because of their profound influence on Christian theology and modern scientific thought. Our present day views on

many questions are determined largely by ideas which have been inherited from these ancient Greek thinkers.

As Christianity grew powerful in the third and fourth centuries, many pagan customs and views were introduced into the church. Pagan holidays and festivals were celebrated, but in honor of Christian saints or events in the history of the church. And while the forms of religion were essentially Scriptural, many Christian doctrines were interpreted according to the philosophical views of Greek scholars.

Among the various Greek ideas that were made prominent at this time was the teaching regarding creation. The outstanding Christian scholar of the late fourth and early fifth century was Augustine. He introduced into Christianity the Platonic doctrine of the immortality of the soul. As to the creation of the earth, he taught that the substance was created by God at some indefinite time in the past, and endowed with power for developing into the highly organized state which the earth now possesses. Thus was laid the foundation for a thoroughgoing evolutionary philosophy, which dominated the thinking of men for centuries to follow.

At the time of the Renaissance in Europe Aristotle's writings were rediscovered. Theologians saw plainly that if the materialistic teachings of Aristotle were allowed to be propagated, they would present a grave threat to the authority of the church, since Aristotle's views were in many ways antagonistic to those of Plato. The day was saved by Thomas Aquinas, who proposed the doctrine of dualism. In other words, he taught that men might think and study as they pleased with respect to the humanities, science and social studies-as long as they recognized the authority of the church in matters of religious dogma and authority. That teaching has enabled the Catholic Church to hold its position of authority in the modern age of scientific development.

CREATIONISM

With the Reformation came a "back to the Bible" movement, which assumed that the Genesis story of creation and the Flood was to be taken literally. The views of the Reformers concerning these questions cannot be termed scientific in any sense, but were purely theological interpretations of the Bible record.

At the same time brilliant Jesuit writers were propounding the doctrine of literal creation in an effort to counteract the philosophical errors that had been introduced into Europe from Greek and Arabian sources.

Thus it came to pass that theologians of all classes, from the sixteenth to the middle of the nineteenth century, departed from the medieval viewpoint of evolutionary development and taught the literal interpretation of Genesis.

MODERN VIEWS ON EVOLUTION AND CREATION

Around the middle of the nineteenth century the rise of modern geological theory introduced confusion into the ranks of Protestant theologians. Attempts were made to harmonize the new geological knowledge with the "days" of the first chapter of Genesis. The Flood was variously interpreted, and many wild and fantastic views were proposed.

The most popular of all geological views at this time was the catastrophism of Cuvier, the great French scientist. He observed in the Paris basin a succession of layers containing bones of extinct animals. These layers he attributed to a series of catastrophes by which the life of the earth had been periodically overwhelmed. Noah's Flood was supposed to have been the final catastrophe. These catastrophes were supposed by many to have been the events to which Moses referred in the Genesis record of the days of creation. Thus arose the "day-age" theory of the theologians, by which Genesis and geology were "harmonized." As a scientific confirmation of Genesis, Cuvier's theories were worthless. The simple facts of the case are that the succession that he found near Paris only involved the Tertiary rocks, which are a small fraction of the sedimentary deposits of the earth, or even of Europe. To interpret these in the light of the "days" of Genesis is absolutely unwarranted distortion of the geological data as well as of the meaning of the Bible record.

In 1785 James Hutton presented to the Edinburgh Geological Society a Theory of the Earth, which proposed to account for all the geological phenomena in terms of long ages of uniform action of natural forces. This doctrine assumed that there had never been any definite "beginning" and there would never be any catastrophic end to the earth.

The English geologist Charles Lyell published a voluminous work, *Principles of Geology*, in

1830, in which he gathered together many illustrations of Hutton's hypothesis, generally known as uniformitarianism. During the next quarter century this hypothesis rapidly gained popularity, until by the time of the publication of Darwin's Origin of Species in 1859 the scientific world had quite fully accepted it. Thus the way was prepared for complete acceptance of evolution when the 'Darwinian theory gave a plausible explanation for the organic aspects of the problem.

The advent, or Millerite, movement, which culminated in 1844, focused attention on the literal interpretation of Scripture. While little was said regarding the origin of the earth, much was said of its expected destruction by fire. The Adventists generally accept the Bible record in its simple, matter-of-fact rendering.

When the disappointment of 1844 turned many away from their belief in the literal return of Christ to this earth, the churches committed themselves quite generally to liberal doctrines that were colored by the influence of German higher criticism. The clergy turned toward belief in uniformitarian geology, and accepted the theory of long ages of time with little or no protest. The Bible record of the Flood came to be regarded as merely a tradition; and as for biological evolution, about the only serious objection to Darwin's Origin of Species when it was published was that it implied the animal ancestry of man.

At the very time that the Protestant churches of Europe and America were turning to evolutionary views, the Seventh-day Adventists arose, and their attitude was that of consistent and thoroughgoing acceptance of the literal Genesis record. As a matter of historical interest it may be noted that even those who do not believe that Ellen G. White received inspired visions have quite freely admitted that her descriptions of the early history of the earth have exerted a powerful influence in molding these literal views of the Seventh-day Adventists.

It was not until the beginning of the present century that much attention was given to scientific aspects of the Genesis record. The first and for many years the only scientific writer of any prominence among this people was George McCready Price, whose principal points of contention were two; namely, (1) that there is no proof of long geological ages, but that the various types of life had been contemporaneous instead of consecutive, and (2,) that while there had been change within the major groups of animals and plants, there has been no change from one such group to another. Under various aspects and by various arguments and illustrations these propositions have been kept before the public for almost half a century of active writing and speaking. The most important work of this leader in modern catastrophism was in pointing out the weaknesses and inconsistencies in the popular geological theories.

From the rediscovery of Mendel's laws of heredity in 1900 the problem of the origin of our present-day species took on new interest. Darwin had built his theory on outward appearances alone, but twentieth-century theories of the origin of species have been based on experimental work in genetics. For forty years the controversy continued over the question of whether new species had actually arisen or whether all our modern "species" were merely variations in originally created kinds. In 1940 my book Genes and Genesis was published, giving a review of the whole situation, and pointing out the fact that while modern science has shown the possibility of many changes in the lower categories resulting in the production of new species or genera, it has failed to prove that such changes are sufficient to account for the higher categories, such as families, orders, classes, and phyla. Much the same argument has been followed in a later work (F. L. Marsh, Evolution, Creation, and Science, 1944), with additional discussion of the relation between the "Genesis kinds," as he conceives them, and modern "species."

10. Creation and Science

IN preceding chapters consideration has been given to the scientific facts that have a bearing on the question of whether the earth and its life came into being by direct creation or were evolved by natural processes. It would be well in conclusion to review these main points briefly and to bring together the major scientific aspects of the creationist philosophy as it stands opposed to evolution.

MATTER AND ENERGY

Although matter and energy are realities, they must be considered as realities of creation, not of

independent existence. The chemical elements and compounds are so diverse in their manifestations, which we call "properties," that it is impossible to imagine them as eternal, having always possessed these properties. But when we begin to analyze the complex properties of chemical substances, we find it absolutely out of the question to explain the more complex in terms of the simpler. For instance, water is a compound of oxygen and hydrogen. But its properties are not a combination of those of oxygen and hydrogen. Similarly, sulfuric acid is made of hydrogen, sulfur, and oxygen; but its properties are not those of its components.

The only satisfactory explanation for the properties of matter is that God created material substances as instruments through which to manifest His power. He has ordained that certain combinations shall manifest His power in certain ways, but the properties are not the result of any inherent activity of the matter itself.

The Greeks conceived of matter as made up of discrete particles, which they called atoms, because they were supposed to be the final indivisible units. The properties of matter were supposed to be due to the sum total of the properties of the atoms themselves. This hypothesis, however, did not settle any of the problems, for ultimately there remained the question as to what gave the atoms their properties.

The difficulty in all such materialistic interpretations lies in the failure to recognize the fact that the atoms are complex dynamic systems, made up of units of force, such as electrons, protons, etc. This dynamic system, therefore, does not exist as an ultimate lump of matter, but as a combination of forces. But forces must have a source; they cannot exist in and of themselves. Thus we arrive at the conclusion that there must be some ultimate cause of causes back of and behind all material things. This makes it a logical necessity that we accept the creation of matter as the only possible interpretation for its origin and its properties. We have now overcome the difficulty in the idea that matter is self-existent.

ORGANIZATION OF MATTER

Matter and energy, even though they might have existed independently, could never have constituted an organized universe. The very existence of organization is a proof for creation.

Let us suppose we have enough type to set up a copy of the Constitution. How long would we have to pick at random and place the type in composing sticks before we happened to get every letter and punctuation mark in the right place? How long would it take for blind chance to "compose" a living creature? How long to bring together a world? And what about solar systems, galaxies, and super galaxies? The laws of chance are so remote, even on the smaller units of existence, that when we think of the greater units we cannot but see the hopelessness of trying to bring order out of the chaos by any kind of blind, automatic action.

The creation record of Genesis is not simply a record of origin, it is a record of organization. The matter was first created, then formed into land, sea, and sky. Then living creatures were produced, each "after his kind," in systematic order.

From the organization of the simplest atoms, throughout the complex groups of substances, to the minerals and rocks, to the living creatures, from atoms to worlds, from cells to living creatures, from worlds to systems and systems to galaxies-in and through all this marvelous universe may be seen divine plan and order. And this order is so complicated that none but an Infinite Mind could have planned and directed it. The very fact that so much mental effort is required to understand scientific principles is evidence of the Intelligence that is back of all natural phenomena. Things did not "happen;" they were the products of the power of Infinite Wisdom.

Nature is full of evidences for design. Take, for example, the manner in which physical factors are related so as to make life possible upon the earth. The range of temperatures between interstellar space and the interior of stars is millions of degrees. Even on this earth, temperatures range from below zero to thousands of degrees above. Life can exist only in a small part of this range. How is it that the surface of the earth is maintained so closely within the limits that allow the existence of life? Surely not by chance, for the laws of chance would not make such a small range likely. We must recognize that the hand of the Almighty is controlling the physical factors acting upon our earth in order to allow life to continue.

When one enters the field of biochemistry, the wonder becomes even more profound. For life exists, not in a simple mixture of elements, but in an almost incomprehensible complexity of chemical substances making up what we call "protoplasm." The wheel within a wheel of Ezekiel's vision is probably the best concept one can suggest for the complexity of the activities by which life is carried on. Not only does protoplasm contain mixtures of protein, fats, sugars, and minerals, but it actually manufactures other

substances such as hormones and enzymes and uses them to regulate its processes.

Amazing as is the chemistry of living bodies, even more amazing is the manner in which these bodies develop from simple cells during the embryonic process. Take for example, any of the well known animals. Each begins as a single microscopic cell. Within this tiny bit of protoplasm is a small portion, the nucleus, inside of which are groups of protoplasmic thread known as "chromosomes."

On these are infinitesimally small granules, the genes. These genes not only transmit the stream of heredity from one generation to the next, but they also govern the development of the body from the single cell to its fully completed state, and do so in such a way that when it is fully developed it has not only become a new individual "after his kind," but possesses those peculiar characteristics that enable one to recognize its exact relationships to others of its kind. In other words, heredity is so accurate in its laws that we say of a child: "He has his father's features," or "He is a perfect image of his mother."

It is hard to see how anyone can follow through the changes in the embryo without seeing in them the working of a superintending Providence. The single cell divides to form a ball of cells; they in turn become a hollow tube; three germ layers appear, the ectoderm, mesoderm, and entoderm. From each of these arise certain tissues, which combine into organs. Each part arises at exactly the right time and in exactly the right place so that they all fit together perfectly to form the completed organism. There is in each developing embryo an inconceivably complex chemical mechanism, by which enzymes and hormones are released in exactly the right proportions and at the right stages to stimulate the development of new tissues and glands, which in turn liberate other substances to carry on the process. How can such a complicated series of events come by accident?

We might go through the whole realm of biology and point out wonder after wonder that require intelligence and design. A few of these might be mentioned: the social life of ants, termites, bees, and wasps; the relationship between the yucca flower and the Pronuba moth. The fig wasp and the development of figs; the relation between insects and flowers in general; devices for preventing self-pollinization; bird migration; different types of eyes, as seen in mollusks, arthropods, and vertebrates; faculties of the human mind.

The thousands of adaptive structures by which plants and animals carry on their life and maintain their existence constitute abundant evidence for intelligent design in nature. Let anyone try to figure how these things came by chance and he will see how unreasonable is the materialistic view of nature and how necessary it becomes to believe in creation.

UNIFORMITY VERSUS SUPERNATURALISM

Belief in evolution rests on the unproved and unprovable hypothesis of uniformity—that throughout the past, natural processes have gone on at the same rate as now. According to this idea, all the actions of the past have been uniform, and there has been no universal catastrophe to destroy the earth.

Not much thought is required to arrive at the conclusion that the uniformitarian hypothesis is incapable of proof. Accurate scientific records have been kept only a comparatively few years; how can we prove that climatic conditions have always been like those we know? How can we prove that the sedimentary rocks of the earth have been deposited under conditions now prevailing? How can it be proved that the uplift of the mountains and the outpouring of the molten rocks were slow and uniform? These and many other phenomena are assumed to have taken place naturally, but this assumption cannot be demonstrated.

Creationism and Flood geology are based on the idea that God brought the world into existence by supernatural means, and that He destroyed it by a catastrophe. Each of these two ideas supplements the other. To be consistent, we must believe in a literal creation and a world-wide destruction.

The doctrine of creation is based on the plain statements of the Bible, and supported by logic and reason, as previously pointed out. Flood geology rests on the literal interpretation of the Genesis record and is supported by evidence from the rocks. The ecological zonation theory, as already suggested, will explain the sequence of the fossils without recourse to long ages of deposition.

NO NEW KINDS

On this point it is important to notice that although biological science has arrived at a fairly clear understanding of the manner in which modern species and genera have arisen, there is no scientific evidence for the origin of the higher categories—the families, orders, classes, and phyla. To the creationist who believes that God created all plants and animals after their kinds, this fact is significant. Between the

Creation Speaks

families-for example, between the dog family and the cat family-there are such clear cut distinctions that it is practically impossible to believe that any known genetic changes are capable of deriving one from the other or both from common ancestry. In this case, therefore, the family seems to some students of the problem to satisfy the requirement as an original Genesis "kind." On the other hand, families appear to have been divided into smaller groups. In the case of the cats, it is likely that lions, jaguars, lynxes, and such groups have descended from separate original "kinds."

The fact that no proof can be given for the origin of new "kinds"-new families, orders, etc. - constitutes a complete scientific vindication of the Genesis story of the creation of each "after his kind."

The fact that variation has taken place, and that the variants have been distributed over the earth in a mosaic of species and subspecies in no way proves evolution. On the other hand, once it is recognized that these variations have all taken place within the kinds, or by means of a limited amount of confused crossing between similar kinds, the more clearly can it be seen that all the facts of variation, adaptation, and distribution fit into the creationist viewpoint.

SCIENCE AND FAITH

In conclusion, it can be truthfully said that scientific theories which are not in harmony with the simple record of the Bible are unproved and unprovable. The established facts of science can all be fitted into the literal Genesis record.

Whether in the field of logic, mathematics, astronomy, geology, archaeology, biology, or in any other field of science, the creationist who accepts the Bible story as inspired history finds it possible to interpret the data in accordance with this literal story. It is said that the greatest reason why men have accepted evolution is not that it can be proved, for evolutionists generally admit that positive proof is impossible, but rather that known scientific data can be interpreted in the light of the evolutionary theory. Thus, one ought to be as ready to accept the creationist doctrine if it can be shown that scientific data can be correlated with it. The purpose of the discussions in this book has been, not particularly to disprove evolution nor to prove creation, but rather to show how the facts of science fit with the Scriptural doctrine of creation. The way will be open, then, to accept creationism as a plausible explanation of the earth and its life.

Now that we have placed creation with evolution as a scientific theory, what basis do we have for a choice between them? Here is where we must make our final decision, and it is upon this basis:

The evolution theory, including the geological ages and the origin of the present life of the earth by evolutionary processes, is based on human opinions and assumptions.

The creation doctrine, including the origin of the earth, the creation of plants and animals each "after his kind," and of man in God's image, is based on the plain statements of the Bible, which is given by inspiration of God.

Upon which basis do we prefer to build our scientific knowledge? The facts are the same for all; whether evolutionist or creationist, we learn the same laws, we observe the same phenomena. The difference lies in the interpretation that is placed on them.

In the final analysis one must choose one of two logically consistent systems of interpretation, either pure materialism, which dispenses with the need of an intelligent Deity, or a system which recognizes that the universe is upheld by the power of a God who personally and directly superintends the activities of His vast creation. A person cannot believe the doctrine of inherent natural force without committing himself to infinite regress, which explains every phenomenon in terms of some other natural phenomenon, with no place for a beginning or an end. The doctrine of a personal God centers everything in a personality with a mind and a will. In all reason, therefore, this interpretation is the only satisfactory one.

Some persons claim that it is unscientific to believe in God. But it should be pointed out that these same persons find themselves in the world, and accept the common facts of daily life without proof. They learn to read, to do business, and to take the experiences of life as a matter of course. Why should they hesitate to accept the idea of a supreme intelligence? Men who have received visions of deeper things of the Spirit are confident that there is a God. Why should His existence be doubted because it cannot be demonstrated by scientific methods? Light, gravitation, electricity, and all the other forces of nature are taken for granted, though no one can tell what they are, nor explain them. Naturalism has to take all its basic principles for granted. Why should it be considered any less scientific to believe in the existence of God? The difference between the position of the Christian and that of the materialistic evolutionist is that one assumes a natural, material, impersonal cause, while the other assumes the existence of a personal God,

Creation Speaks

as the immediate and direct cause of all natural phenomena.

The Bible has been accepted by millions of men as the revelation of God to man. If this is wrong, religious experience becomes mere superstition, and the skepticism of the critic is lifted to a more exalted position than the deep moral conviction of millions. To replace a belief which is grounded on the experience of men by an unproved and unprovable hypothesis is a serious matter. Let the skeptic weigh carefully the responsibility which the universe would ask him to bear if he denies to God His rightful place as ruler of the material as well as of the spiritual world.

"He that comes to God must believe that He is." Hebrews 11:6. The element of faith cannot be avoided, even in the scientific field. There is no way to get at the underlying "Cause" of the universe except by faith. Natural forces do not proclaim their own origin. There are only two choices, either a blind mechanical causality or a personal God. The creationist chooses the latter, and offers no apologies for his choice; nor can anyone prove that it is unscientific.

There may be some who think that nothing can be known with certainty—that all human knowledge is merely guesswork, speculation, or imagination. This attitude of mind leads to the conclusion that science is nothing but an accumulation of human opinions, with no settled basis of truth, and that philosophy is only a vagary, the diffuse muttering of disordered minds. Such a viewpoint of life is entirely unsatisfactory, and will accomplish no good result. Life must be conducted on a positive plane if any good is to come from its activities. Some settled ground for behavior must be found if men are to continue to pride themselves on being rational human beings.

The skeptical attitude leaves a man weak and helpless before the great problems of life. Unless he has faith in some underlying causes for the phenomena of nature, he cannot attack those phenomena with any assurance of understanding them. The universe is a cosmos, not a chaos. Things are ordered according to law, and do not occur haphazardly. Science has achieved no greater triumph during the past three hundred years than to reduce an apparently confused mass of natural phenomena to orderly, systematic arrangement, and to discover the laws that govern this organized universe. Today no man who has any training in science thinks of questioning the validity of the great mass of scientific knowledge; and all investigators of nature proceed on the assumption that nature is organized in an orderly manner.

Order demands intelligence. Who ever heard of inanimate objects organizing themselves into systematic groups? Furthermore, the orderly organization of nature is intelligible. In other words, man, as a thinking and reasoning being, can understand the relationships existing in nature, and can get some idea of the meaning and purpose of these relationships. He looks upon the flower blooming above the black soil, and as he studies its life he finds certain laws of physics and chemistry manifested in its structure. He learns that these laws govern the flower's ability to assimilate its food and to produce its lovely blossoms. He appreciates the underlying forces at work; and when they have accomplished their purpose and the completed bloom appears, he marvels at the beauty that has been revealed. So in all the phenomena of nature; intelligent organization is displayed. Certainly, if these things are intelligible to human minds, they must have been the product of some other intelligent mind. There must have been a mind at the other end, or our minds would not have been able to grasp the meaning of the orderly processes in nature.

The very fact that all the laws of science have a mathematical basis should be ample proof that they proceed from a mind of profound intelligence. It requires exact, deep thinking to understand the laws of higher mathematics. These laws are not, and could not be, the result of chance; they must have been ordered by a higher intelligence.

This world is a world of life, and from the tiniest mote that floats in the sunbeam to the mightiest denizen of the sea, all nature vibrates with the forces that life sets in operation. Air, water, and the earth itself—every corner and cranny of our globe—abound with living, active creatures.

Life manifests itself not merely in activity, but basically and fundamentally in expressions of ideas. Gazing at a beautiful painting, the beholder catches the inspiration of its meaning, and says that he understands the thought of the artist, who, as a living, thinking, feeling person, embodied his ideas in the pattern of the pigment on the canvas. His character is displayed in the work which he produces, quite as truly as in the activities of his own body. So it is with the sculptor, who puts his own soul into the marble or the bronze. The photographer, even, who catches on the film the subtle beauty of the landscape, composes his scene in such a way as to interpret its meaning to him. The musician draws from his instrument those strains that will tell the story of his inmost heart; his emotions are bared to the world by the chords that he plays.

If he will, the naturalist may find in the world of the great outdoors myriad illustrations of this

Creation Speaks

same truth, for nature stands as a great object lesson designed by the mind and created by the hand of the Infinite. Each manifestation of natural law reveals the character of the great Lawmaker; each strain of natural music tells of the heartthrobs of the Master Musician; each bit of beauty displayed in flower and sky shows the skill of the divine Artist. The mighty mountains speak of the wisdom of the Supreme Architect. He who can look at nature and see in it only a blind array of self-operating forces has failed to see the real meaning of nature and science. To the deep thinker the intricate laws revealed in the field of scientific investigation show a Master Mind behind all things.

The charge is sometimes made that the belief in God implies the idea of caprice in the operation of natural forces, that if natural forces are under the direct control of God, they may be erratic in their action. Such a charge is without foundation. The exactness and system observed in natural phenomena is an evidence of the wisdom of the Ruler of nature. His omniscience is so far-reaching that He has no need of changing His manner of working through His created things; yet He is not bound by nature, but can supersede the ordinary manner of working by actions suited to the occasion, when the need arises.

SCIENCE AND THE BIBLE

One who takes the position that there is a Supreme Being is bound to look for evidences of His revelation to man. Any system of thought that would deny God the right to communicate with His children would deny the very essence of His personality. In a pantheistic system all nature would be a revelation, and the only revelation possible. According to the materialistic conception, natural revelations are the only ones possible. On the personal basis, special revelation is as reasonable as the idea of the existence of God. Accordingly, the Bible as the word of God is an essential doctrine to those who believe in the personality of God. There is no alternative; either the Bible is God's revelation to man or there has been no divinely revealed truth.

At once the cry is raised that the Bible is being placed on a scientific basis and used as a textbook of science. In reply it may be said that it is not a textbook, but does contain the fundamental principles to which all interpretations of scientific discoveries must conform. If there is a God, He must be the author both of the Bible and of nature, and the two must agree. If the Bible is to mean anything at all, it must be inspired by the Spirit of God; and if thus inspired, its historical records must be true. When, therefore, human speculative methods of thought presume to interpret the past history of the earth in a manner diametrically opposed to the record given in the Bible, Christians ought to object and to take their stand on the declarations of the word of God. They ought willingly and knowingly to allow themselves to be known as opposing the current interpretations in regard to the origin and past history of the earth. In so doing they may rest assured that these interpretations are not scientifically proved facts, and they may feel that they have the right to take exception to them.

The scientific world is today in a state of confusion because it has denied the truth of a personal God as the center of life and force in the universe. It has interpreted nature as a self-running mechanism and assumed the ability of the human mind to explain the phenomena of nature and to interpret their significance in the moral and spiritual realm. It has refused to accept the divine revelation regarding the past history of the earth and has substituted in its place a speculative theory of long ages of evolution. The struggle for existence, the presence of degeneracy and death, and in the moral world the 'fact of evil-these and many other points are interpreted in the light of evolution instead of the Bible record of the fall of man and the reign of rebellion. Science has exalted human research; theology has adopted its methods, and has turned to a social gospel instead of the religion that exalts Jesus as a divine Savior.

The greatest need of the world today is not more scientific research, although facts thus brought to light are valuable; the world needs a true philosophy to enable it to make a correct interpretation of facts already known and to guide it in the acquirement of new knowledge. A new revelation is not needed, but faith to accept the one already given. Men the word of God is accepted as a guide in scientific research as well as in spiritual study and experience, then, and only then, can men hope to solve the great problems of science and religion.